The OIL and GAS JOURNAL

PRODUCING REFINING ENGINEERING MARKETING

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Production Held Nearly Stationary

Highest daily average estimated total production in 1927, week ended July 30, 2,587,105 bbls. Lowest in 1927, Jan. 22, 2,360,789 bbls.

Gain in California Nearly Offset by Declines in Mid-Continent and Other Areas. Outlook Continues Bright

By Andrew M. Rowley

Highest daily average estimated light oil production in 1927, week ended July 30, 2,102,385 bbls. Lowest in 1927, Jan. 1, 1,790,729 bbls.

Despite the fact crude oil production in California last week averaged about 21,000 barrels daily more than for the previous week, the output for the United States showed a gain of less than 3,500 barrels daily. Production in the Mid-Continent area continues on a downward trend and probably will so continue until about the middle of next February when the Mission Pool in Oklahoma is opened for production. California will show increases in production during the next two months due to development in the Santa Fe Springs Field and Oklahoma will record a substantial gain during the latter part of next February if the Mission area is as productive as it is felt it will prove to be.

The feeling upon the part of many oil men that present crude oil prices are too low and that an increase should be given the producer to permit him a better return is tempered by this prospect of considerable new production. It is pointed out, however, present prices do not allow the producer an adequate profit; and that production in the Mid-Continent area at least is largely in the hands of the larger companies who are unwilling to dispose of their crude, resulting in difficulties on the part of many of the smaller refiners in contracting for their requirements. In addition, the feeling is gaining ground California may not prove the big menace many until recently felt it would as indications are operators in that section will be able to handle most if not all the new production expected there. Also, there is not much doubt production in Oklahoma will be considerably below its present level by the middle of next February when the Mission Pool is opened.

Production of crude oil in the United States during the 12 months ending November 1 of this year totals about 8,300,000 barrels less than the total for the 12 months ending November 1, 1927. During that time consumption has shown an increase.

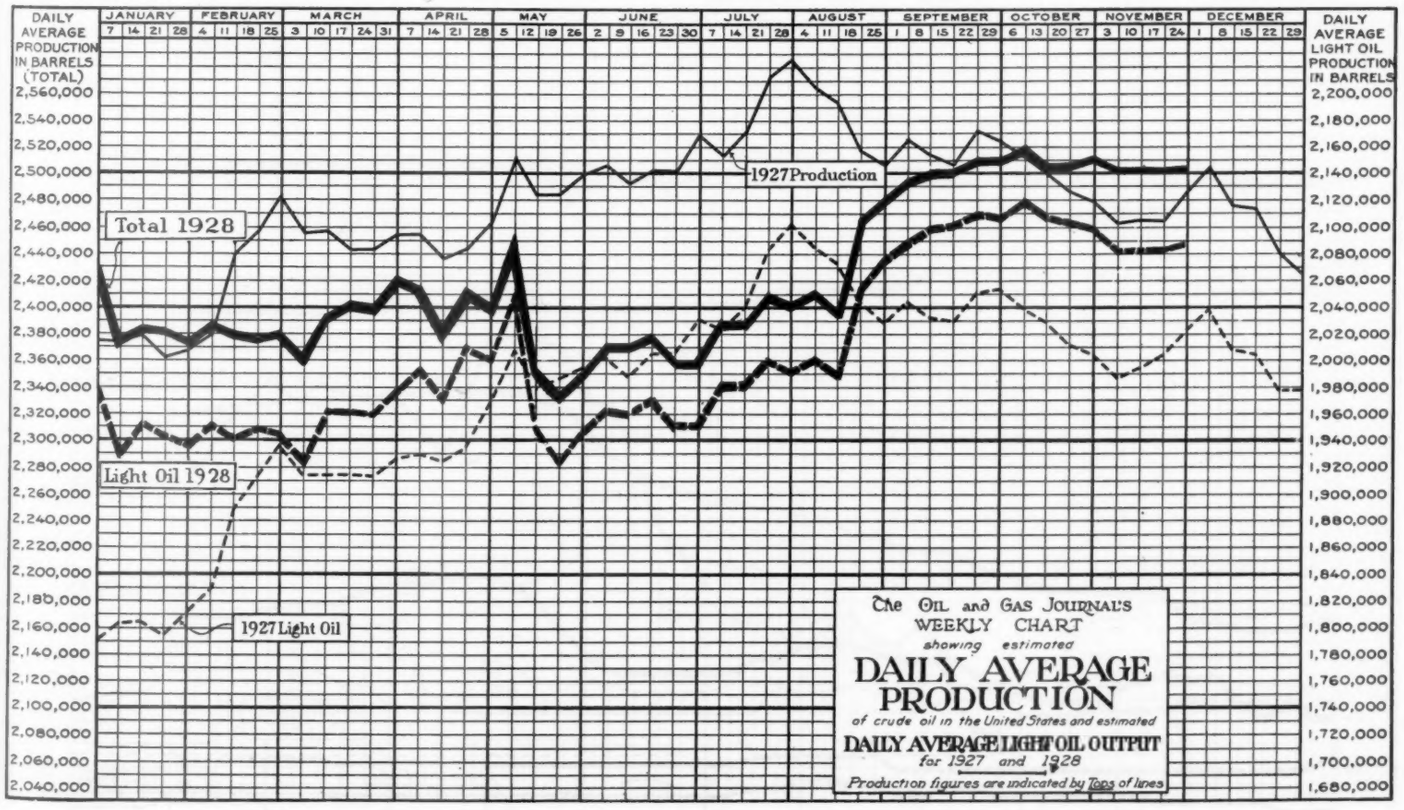
Taken as a whole, the situation at this time is bright and operators are optimistic. As soon as the situation in California and the Mid-Continent reaches a point where the industry may make a more accurate gauge of the quantity of new production expected, definite action in regard to a readjustment of the crude oil price schedule may be expected.

PRODUCTION IN THE UNITED STATES

Estimated daily average production of light and heavy gravity oil in the United States for week ended November 24, and a comparison with the previous week follows:

	Nov. 24		Nov. 17	
	Light	Heavy	Light	Heavy
Oklahoma—				
Tonkawa	11,770	.....	11,715	.....
Burbank	25,565	.....	25,480	.....
Other Osage Fields	25,970	.....	26,020	.....
St. Louis-Pearson	132,080	.....	128,815	.....
Cushing and Shamrock	20,020	.....	20,135	.....
Bristow	20,125	.....	20,440	.....
Allen	24,015	.....	22,955	.....
Seminole	289,210	.....	294,880	.....
Northern Miscellaneous	108,385	.....	108,570	.....
Southern Fields	55,830	.....	56,265	.....
Total Oklahoma	712,970	.....	715,275	.....
West Texas—				
Hendricks	146,328	.....	150,221	.....
Yates	67,342	.....	71,486	.....
Remainder	115,823	.....	116,120	.....
Total West Texas	329,493	.....	337,827	.....
North Louisiana	31,975	6,200	32,535	6,220
Arkansas	29,290	53,765	29,330	54,050
North Central Texas	143,752	.....	143,492	.....
Texas Panhandle	63,380	.....	65,655	.....
East Central Texas	22,009	.....	22,197	.....
Kansas	96,415	.....	96,210	.....
Total Mid-Continent Area	1,429,284	59,965	1,442,521	60,270
Gulf Coast	.....	131,983	.....	131,674
Southwest Texas	.....	31,254	.....	31,370
Eastern	112,000	.....	114,000	.....
Rocky Mountain Area	79,677	.....	81,894	.....
California—				
Santa Fe Springs	70,000	.....	55,000	.....
Long Beach	190,000	.....	186,000	.....
Torrance	2,000	13,750	2,000	13,750
Huntington Beach	50,750	.....	50,750	.....
Elwood	9,950	.....	10,000	.....
Inglewood	16,500	11,000	16,500	11,000
Ventura Avenue	54,000	.....	53,000	.....
Seal Beach	26,500	.....	26,000	.....
Remainder of State	53,000	167,000	52,000	167,500
Total California	472,700	191,750	451,250	192,250
Total United States	2,093,661	414,952	2,089,665	415,564
Grand Total		2,508,613		2,505,229

→ **Total Increase, 3,384 Bbls.; Light Oil Increase, 3,996 Bbls.** ←



Natural Gasoline in Price Advance

Month-End Buying Stops Decline. Widening Distribution of Natural Gas Factor in Fuel Oil Market

By C. O. Willson

Month end buying in natural gasolines which got under way the latter part of last week brought a quick reversal in price trends, the product displaying more strength than any other in the Oklahoma (Group 3) refined market. Indications on Tuesday were that the product would continue strong over the remainder of the month.

The slump in natural gasoline prices starting about the middle of November had led many to conclude that prices would end the month around 8 cents or lower. Several buyers, including a few of the manufacturers, had postponed their final November purchases in expectation of continued decline in prices. When the buyers started to cover their November requirements on Friday and Saturday it became apparent there was not the excess material available that had been expected. Purchases of 10, 20 and 50 cars absorbed the excess material and prices advanced from one-half to 1 cent on the different grades.

The buying of the past few days is said to have placed the natural gasoline market in a strong position for the start of December and the manufacturers are optimistic regarding their market for the remainder of the year.

Refinery Gasoline

The strength in natural gasolines was not reflected in refinery gasolines. The general market on the several grades remains practically the same as last week but the refiners have had more and more difficulty maintaining these prices. Price ranges of 1 cent on the same product are common when both direct and broker sales are considered.

REFINED MARKET BAROMETER

The strongest products in the refined market during the past week were the steam refined cylinder stocks and bright stocks. Important price advances on practically all grades were made effective in Pennsylvania and East Coast, the market responding to a strong domestic and export demand. Neutral oils were not included in these advances no special activity being reported in any area except the Gulf Coast. Scattered reductions in gasoline tank wagon and service station prices during the week did not aid the refinery gasoline market where the trend toward lower quotations continues. Kerosene prices were steady. Distillates are in strong demand and prices are higher. No improvement in the weak fuel oil market developed. Natural gasolines were advanced in the Mid-Continent with no change in California. The wax demand has slowed up and prices are lower in the Mid-Continent.

Mid-Continent—Natural gasolines higher in all areas. Refinery gasolines sluggish and scattered price reductions reported. Kerosene steady. Burner distillates strong. Steam refined cylinder stocks and bright stocks higher. Fuel oil unchanged. Wax prices lower.

East Coast—Market quiet except for continued advances in cylinder stocks. Good demand for premium gasolines. Regular grades sluggish. Steady fuel oil demand. Wax freely offered with price reductions on some grades. Firmness in white grades of petrolatum.

California—Prices unchanged. Some refiners having difficulty moving fuel oil output.

Chicago—Furnace oils feature of market. Industrial demand for fuel oil improved. No change in gasoline prices.

Gulf Coast—Fuel oils sluggish. Several inquiries for neutral oils for export. Domestic market unchanged.

Pennsylvania—Practically all grades of steam refined stocks and bright stocks advanced from 1 to 4 cents a gallon. Gasolines weak and prices reduced on lower gravity grades to meet competition. Other products unchanged.

With a dearth of export business refiners throughout the Mid-Continent are concentrating their sales efforts on the domestic market centering in the states of the Middle West. U. S. Motor gasoline is freely quoted on the Chicago market from Oklahoma, Kansas, Arkansas, North Louisiana, North Texas, West Texas and the Texas Panhandle. The quotations reported varied from 8⅛ to 9⅜ cents.

Narrower margins were reported in the higher gravity grades. Several refiners are specializing on the higher gravity grades suitable for the domestic trade, reducing their U. S. Motor output to a minimum. Many of the larger jobbers want a higher gravity and low initial gasoline for their winter trade and are willing to pay premium over the regular U. S. Motor grade to secure it from their sources of supply.

This situation is a reflection of a general condition in which distributors are offering better gasolines to the consuming trade. The lower distillation range gives the quick start and acceleration demanded by motorists in their motor fuel regardless of the season. This situation has unquestionably been a factor in the strong natural gasoline market, the product being in demand by refiners who need it for blending purposes.

Fuel Oil

Most refiners in Oklahoma and other Mid-Continent refiners are more concerned with the disposal of their fuel oil than gasolines. They anticipated some slump in gasoline prices during the winter months but are confident that a stronger market will develop in the spring. They are not so confident regarding fuel oil.

Observers who have watched the Mid-Continent fuel oil market decline consistently during the past two years place part of the blame on the widening distribution of natural gas. Formerly Kansas, Oklahoma and North Texas refiners were able to sell a large part of their fuel oil output to what was termed a "local trade." Kansas refiners, for instance, sold practically all their fuel oil to small industrial concerns, and pub-

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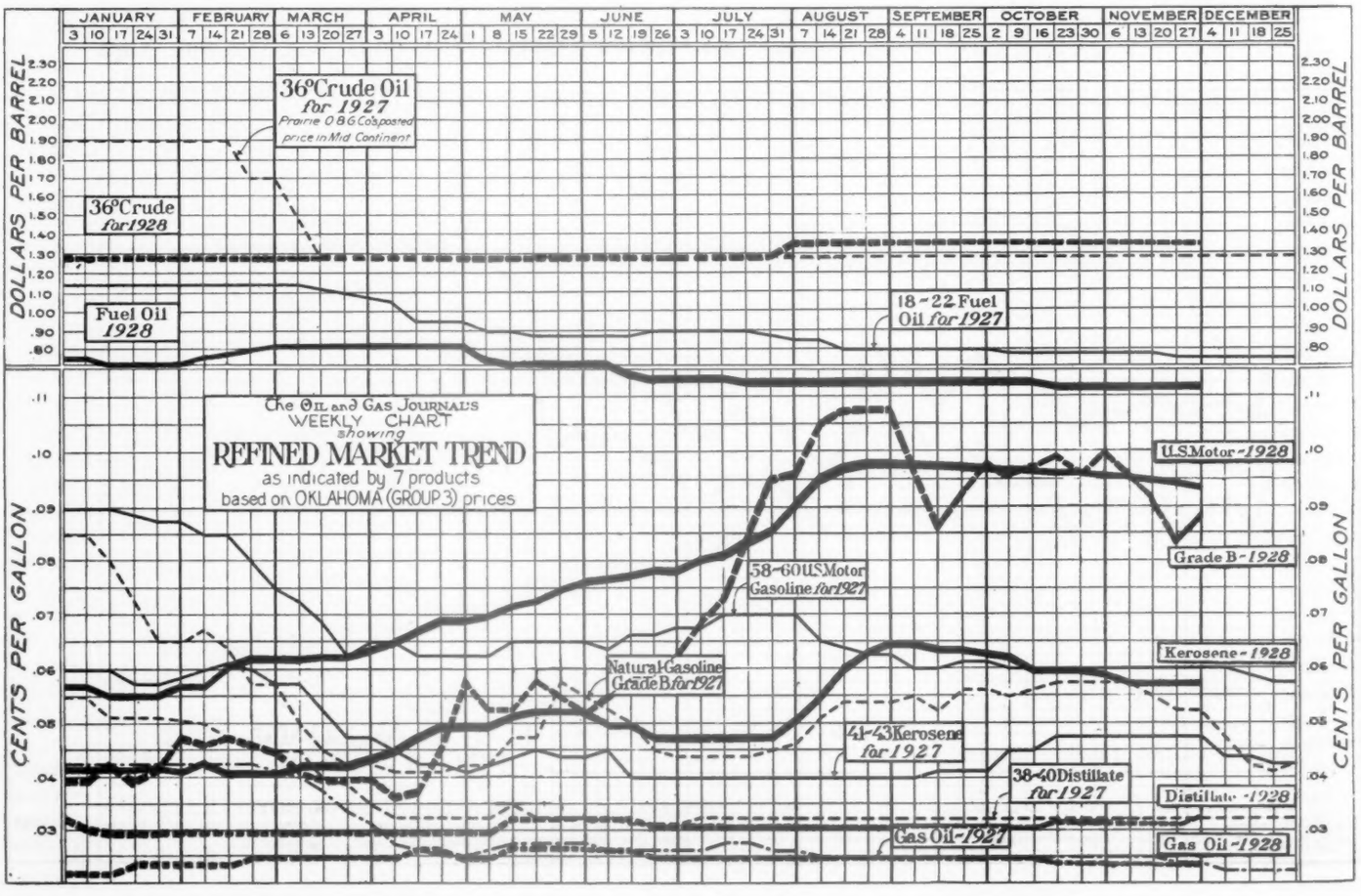

Quantity of "Free" Crude Diminishing

Of the Total Production in Oklahoma Only About 11 Per Cent Is Available for Purchase. Big Producers Hold Their Oil

By J. L. Dwyer

So many changes have been made in the economic picture of Oklahoma-Kansas oil production during the past two years, that if the names of the oil producing companies were erased, and the figure of production revealed, and the quantities of free and controlled oil indicated, the observer of two years ago, would have the utmost difficulty in recognizing the picture.

There have been innumerable changes made in the economic structure of these two states so far as their oil production and distribution are concerned, and probably the most important of all, is the constant decrease in the amount of free oil available to the crude oil purchaser. It might also be worthy of note that there seems to be a distinct relation between the disappearance of free oil, and the disappearance of the individual oil producer.

By "free oil" is meant oil which is produced by companies having no pipe line or refining affiliations of their own, and offered by the producer for sale in the open market. By "controlled oil" is meant oil produced by a company having pipe line or refining facilities or affiliations and thereby removed from the open market.

It is not the intention of this story to forecast any impending oil famine for the near future, but it seems a certainty that the next few years are bound to develop a closer relationship between the producing and refining branches of the larger companies; for, in order to fully supply their refining requirements, they will be obliged to produce the bulk of their oil. They will not be able to purchase any appreciable amount of it in the open market.

Diminishing Supply

Considering the decline of free oil, the question naturally follows, "What about next year's light oil supply?" Several years ago, when a pipe line company wanted to run more oil through its system, it simply sent out some crude buyers, and the necessary oil was purchased. The decline of free oil has eliminated any possibility of this plan in the Oklahoma-Kansas region today, and what free oil there is, is generally in the hands of producers who are very reluctant to part with it or to change connections. In the majority of instances they have had one pipe line company running their oil for a long time, and the springs of their unity are deep, old, and strong. Under this condition therefore, the company must depend to a much greater extent upon its own production.

The condition mentioned will have one effect, that is, it will elevate to unprecedented popularity, the individual or company having any important amount of daily oil production. In this regard there seems very few candidates for high favor, and an inspection of the current oil production records reveals only two names of producers having an exceptionally large amount of free oil in Oklahoma and Kansas; T. B. Slick, Inc. and the Amerada Petroleum Corp. Neither of these concerns has any pipe line or refining facilities; they are producing concerns solely, except that they are interested in the manufacture of natural gasoline.

Consumption Gains

During the past two years, flooded by the oil from the Greater Seminole district, the production of Oklahoma has almost doubled. In the spring of 1926 previous to the discovery of the Seminole region, Oklahoma was producing 450,000 bbls. of oil daily in a consuming market which was barely capable of absorbing that figure. Pool after pool being discovered in the Seminole region, the output of the state increased to a point where it was almost 750,000 barrels during September of this year. During this period of heavy production, nobody paid much attention to consumption, and that factor struggled along without any important press notices. It seems that these two forces might well be compared to the race between the turtle and the hare, for in the year and a half just completed, the consumption of Oklahoma-Kansas crude has overtaken the phenomenally increased production, and is still forging ahead. This steady increase of consumption is one important change in the picture.

Another significant change is the slight bearing which seasonal demand seems to have upon crude requirements. Compilation of statistics seems to have established Labor Day of each preceding year as marking the peak of gasoline consumption. From that date on, the demands for crude seem to have diminished. It was considered normal for the industry to store oil during the fall and winter months, and to make drafts upon crude stocks during the spring and summer periods. This condition is another one which seems to have been changed, and with Thanksgiving Day dawning the Oklahoma-Kansas territory is making drafts upon crude storage, and has been doing so for several weeks.

Drilling Centralized

With the declining amount of free oil, there is also in evidence the decrease of the well promoter. There are innumerable small oil companies which either have been dissolved or merged with larger corporations during the past two years. The extent to which drilling has been centralized during the past two years may best be illustrated by a comparison of the record of drilling wells. In April, 1926, there were 1,680 wells drilling in Oklahoma and Kansas. About 83 per cent of these wells were being drilled by individuals and small companies. In a great many instances, the drilling of the wells was assisted by the contribution of dry hole money by interests owning acreage nearby.

During this month, there are 1,247 wells being drilled in Oklahoma and Kansas, and less than 20 per cent of these wells are being drilled by individual operators or small companies.

The contributing causes for the decreased operation of smaller interests is explained in the fact that during the past two years, the average price paid for crude oil has not been regarded as compensatory. The deeper position of the producing horizon, the greater drilling costs made necessary by the same factor, increased lifting costs, extremely heavy (and costly) equipment necessitated by the business of deep sand production has rapidly and automatically been responsible for the disappearance of the small operator and small company.

The large table accompanying this story shows every active refinery in Oklahoma and Kansas, and shows the quantity of free and controlled oil which they were running during the first part of November. The table on Oklahoma, shows that all the refineries were running 210,000 bbls. of crude oil daily through their stills. Of this amount, 81,025 bbls. was free oil, and 128,975 bbls. represented the controlled oil. Taking the total production of the state at the time these figures were compiled, (720,000 bbls. daily) it will be noted that the refineries could purchase about 11 per cent of the production of the state as free oil, and this amount represents just about all the free oil that is in the state at preset.

The objection might be raised that the refineries were using only the free oil which they required, and that if their requirements were greater, they could obtain more free oil. This is hardly the case. There are 20 producing companies in Oklahoma having a combined output of 518,000 bbls. daily which might be termed controlled oil, for it is not free to the open market purchaser. It will be noted that this amount of oil will just about equal the difference between the current production of 720,000 bbls. and the current refinery runs of 210,000 bbls. In addition to this, there are a great many companies (not listed among the 20 companies) who produce substantial quantities of oil which is turned over to pipe line companies as "tender shipment oil" to be transported by the pipe line and tendered to a consignee indicated by the producer at some point distant from where the production originates. These companies further reduce the amount of free oil.

Percentage of Free Oil

A list of important pools is also included in this story. The list shows the percentage of free and the percentage of controlled oil which is produced in the pools today, and the percentages which were produced in 1926. In only one field has the percentage of free oil increased during the past two years, and that field is Burbank where it has increased from 47 to 62 per cent. In every other field, the free oil percentage has diminished, and it must be borne in mind, that the production has decreased.

Considering the pools which were not producing during 1926, and which furnish the bulk of Oklahoma production today, the Searight and Allen deep sand pool have available 55 and 64 per cent free oil respectively, but both have been rather limited to date. The pools which have made the big production show a heavy domination in the controlled oil percentages such as Seminole City, 75 per cent controlled; Bowlegs 84 per cent controlled and Earlsboro 85 per cent controlled. These pools make in a week as much oil as Searight makes in a month. Little River, the most recent of the Seminole pools to be developed, shows 91 per cent controlled oil and 9 per cent free oil.

If the free oil continues to decline in the next two years as it has in the past two years, the producer may come into his own.

Comparative Free Oil in Largest Oklahoma Pools in 1926 and 1928

Pool—	Per cent free oil 1926	Per cent free oil 1928	Per cent controlled oil 1926	Per cent controlled oil 1928
Cushing	32	25	68	75
Healdton	30	26	70	74
Garber	7	5	93	95
Cromwell	46	41	54	59
Hewitt	32	27	68	73
Tonkawa	19	14	81	86
Burbank	47	62	53	38
Other Osage fields	63	51	37	49
Wewoka	59	52	41	48
Papoose	77	73	23	27
Seminole City	..	25	..	75
Searight	..	55	..	45
Bowlegs	..	16	..	84
Earlsboro	..	15	..	85
Little River	..	9	..	91
Allen	..	64	..	36
St. Louis	..	..	29	71
Lovell	..	0	..	100

Oklahoma Refineries

Plant—	Daily runs	Free oil	Controlled oil
Anderson-Prichard Co.: Cyril	2,000	2,000	....
Barnsdall Oil Co.: Barnsdall	3,500	....	3,500
Barnsdall Oil Co.: Okmulgee	3,000	....	3,000
Bell Oil & Gas Co.: Grandfield	2,100	2,100	....
Bolene Ref. Co.: Enid	4,000	3,500	500
Champlin Ref. Co.: Enid	13,000	7,000	6,000
Continental Oil Co.: Sapulpa	4,000	....	4,000
Cushing Ref. Co.: Blackwell	1,700	1,000	700

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A.P.I. CONVENTION IN CHICAGO TO CONSIDER IMPORTANT MATTERS

With a program replete with subjects of great importance to every branch of the petroleum industry and other matters of widespread interest to be considered, the ninth annual convention of the American Petroleum Institute in the Stevens Hotel, Chicago, December 3, 4, 5 and 6 is expected to attract the largest number of executives of the petroleum industry ever assembled. The convention really gets under way Saturday of this week when several committee meetings are scheduled. Next Monday a majority of the various committees of the institute will hold meetings preparatory to the formal opening of the convention on Tuesday.

Especial interest is being manifested this year in meetings of the board of directors of the institute, the first of which will be held next Monday. It is expected a number of matters of vital importance to the industry as a whole will be discussed by the directors with a possibility some definite action may be taken towards outlining the policy of the institute on the questions involved.

Two subjects which have given the petroleum industry much concern during the past year or so will be discussed at the annual dinner which brings the convention to a close on the night of December 6. Gurney E. Newlin, president of the American Bar Association, will talk on "Trend in Oil and Gas Laws"; while Sir John Cadman, chairman of the Anglo-Persian Oil Co., will speak on "Petroleum Problems Outside the United States."

A number of directors will be selected at the convention next week. Those whose terms expire this year and the names of those suggested for nomination to the places follow:

Production Group

The terms of office of L. P. St. Clair, D. S. Ewing and F. H. Hillman expire.

One or more of the councillors for the Pacific Coast group have suggested the following: W. H. Berg, Standard Oil Co. of California, San Francisco; Dave S. Ewing, Ethyl D Co., San Francisco; M. E. Lombardi, Standard Oil Co. of California, San Francisco; L. P. St. Clair, Independent Oil Producers Agency, Los Angeles; H. M. Storey, Standard Oil Co. of California, San Francisco.

The term of office of W. S. Farish expires.

One or more of the councillors for the Central United States (Production) group have suggested the following nominees: W. S. Farish, Humble Oil & Refining Co., Houston; F. V. Faulkner, Magnolia Petroleum Co., Dallas.

The term of office of A. F. Corwin expires.

One or more of the councillors for the Eastern United States group have suggested the following: A. J. Byles, Tidewater Associated Oil Co., New York; A. F. Corwin, Standard Oil Co. of New York, New York; L. W. Young, Jr., South Penn Oil Co., Pittsburgh.

Manufacturing Group

The term of office of H. R. Gallagher expires.

One or more of the councillors for the Pacific Coast group have suggested the

(Continued on Page 162)

George H. Jones Succumbs to Ailment

Chairman of Board, Standard Oil Co. of New Jersey, Passes Away After Protracted Struggle Against Illness

By Special Correspondent

NEW YORK, Nov. 26.—George H. Jones, chairman of the Standard Oil Co. of New Jersey, died at Harbor Hospital, New York City, at 7:45 a. m., Thursday, after a protracted illness.

In poor physical condition for several years, the result of lengthy and constant application to his work, Mr. Jones' final illness necessitated two abdominal operations since he entered Harbor Hospital in September. The first operation was performed September 20, and, when he did not show improvement, a second took place on October 11. These were followed by blood transfusion, and as recently as last week it was thought he had a chance for recovery.

Directors of the Standard Oil Co. of New Jersey were honorary pall bearers at the funeral services at Pelham Manor, New York, Saturday. Services were held at the Huguenot Memorial Presbyterian Church, a special train from New York bringing many friends and associates. John D. Rockefeller, Jr., was one of the mourners.

The honorary pall bearers were: Walter C. Teagle, president of the Standard Oil Co. of New Jersey; S. B. Hunt, vice president, and the following directors: C. G. Black, Walter Jennings, E. J. Sadler, E. M. Clark, J. H. Senior, C. O. Swain, F. H. Bedford and Heinrich Von Riedemann; others at the services were: C. O. Stilman, president of the Imperial Oil Co.; A. K. Gordon, vice president of the Standard Oil Co. of Louisiana; Victor Ross, vice president of the Imperial Oil Co.; R. W. Gallagher, president of the Peoples Gas Co., Cleveland, Ohio; C. T. White, secretary, Standard Oil Co. of New Jersey; Miss Adele Miliers, who was private secretary to Mr. Jones, and John Brown, negro office messenger for Mr. Jones for the past 30 years.

A telegram of condolence to Mrs. Jones from Rev. Olin Clark Jones, pastor of the Trinity Church, Oil City, Pa., Mr. Jones' old home, was read at the services. Interment was at Kensico Cemetery.

Mr. Jones' Career

George H. Jones, chairman of the board of directors of the Standard Oil Co. of New Jersey, was one of the best-liked men in the American oil industry, and generally regarded as one of the best posted as well. Born at Carthage, N. Y., September 22, 1872, he spent practically all of his business life in the oil business, starting with the National Transit Co., a Standard Oil subsidiary, in 1890.

Mr. Jones worked his way up from the very bottom of the ladder. Born, as he often declared, "without even a tin spoon in his mouth," he went through the usual small-town boyhood. His father, a veteran of the Civil War, who had lost a leg in an accident, was a carpenter. His schooling was obtained under difficult circumstances. Times have changed so much in the past half century that it is difficult to describe the conditions surrounding Mr. Jones' boyhood without making it appear that he was a subject for sympathy. Fifty years ago work was a natural life for a small boy in the country. The state did not supply free textbooks nor demand compulsory attendance up to the age of 14 in its schools, and there were too many calls on the money earned by Mr. Jones, Sr., at his carpentering to leave any for the purchase of other than actual daily necessities. But there was a well-to-do boy in the neighborhood who got the books required by the grammar school, and an arrangement was entered into whereby George H. Jones could borrow this young friend's arithmetic, geography and reader at odd times. It may be that the limitations upon the time allowed him for these books was in part responsible for one of the outstanding traits of Mr. Jones in later life—his remarkable capacity for memorizing with a single reading and for getting to the heart of a problem with the minimum attention to extraneous details.

On Saturdays and through summer vacations Mr. Jones did his bit toward meeting the household expenses by doing any task that came to hand. He was a utility boy in the mill, sorting rags for the picker, running errands, sweeping up litter, and so on. Also, as a very small boy, he worked in the local chair factory. The child labor laws and the unions both forbid what he did then, for he started his day's labors at 6 o'clock in the morning and was not released for supper until the whistle blew at 6 o'clock at night. The 35 cents a day that he was paid in the mill was of no small importance to his mother. There was no observance of Christmas in his home. Sometimes it would have been hard to find a whole stocking to hang up for a Santa Claus who never found the Jones chimney.

George H. Jones

Schooling Was Brief

His schooldays ended when he was 14. It cost money to go to an academy, and it was not the general custom, as it is today, for boys and girls to continue through a secondary school. He obtained a job in an insurance office in his home town. There it was his duty to open the office very early in the morning and get it ready for the coming of the other employes. In winter he was on the job at 6 a.m., building a fire in the office stove and then busying himself with the manifold odd jobs that could be put upon a boy. His employer paid him $3 a week, which was considered a good wage in those days. As he grew more familiar with the business the new office boy was used to make deliveries of policies and to call upon clients when renewals were due. Much of this work had to be done after the office closed at night. From there it was a natural step for the youthful clerk to sell policies and make new clients for the firm.

At the end of a half year the insurance man was well pleased with the progress made by his employe and voluntarily increased his wage to $5. He might have cost the oil industry a good man and made insurance the life work of his assistant but for a change of heart suffered at the end of the first year. Calling his clerk in, he informed him that his wages for the next year would be $4.50 a week. The employer endeavored to make it appear that this was a substantial increase over the average for the previous year of $4, but the youthful Jones could se it only as a reduction of 50 cents a week, and thereupon resigned. It was the first and only job from which he ever resigned, either voluntarily or by request.

Self-Education

It might be seen from the foregoing that the boy had had enough to do in his year in the insurance business without seeking opportunities to study, but he realized his need for more education than he had obtained in grammar school. He acquired a textbook on shorthand, and with an unusual faculty for learning things quickly and permanently, mastered the alphabet and all the word signs. For practice he would utilize spare moments and an occasional respite after the day's work to go over all of the communications which had come into the office, transcribing them into shorthand. He did not have access to a typewriter, but considered himself lucky when he obtained an old Remington catalog carrying a facsimile of the keyboard on the back cover. He cut this out, made an imaginary typewriter by mounting the characters on a board, and with this contraption on his knees typed out imaginary letters from his shorthand notes.

With this training acquired, he decided to take a commercial course. He had heard of a business college in Oswego, N. Y., and on the day before Christmas journeyed there with his few personal belongings and his total cash "stake" of $40. He presented himself to the owner of the school as one who had made some study of stenography but not knowing how far he had progressed. He was accordingly put into a room of backward and beginning students known to the school as the "Wilderness." A few minutes there demonstrated to the satisfaction of the teacher that he belonged in a higher grade and by successive stages he went through three more grades before the end of the first day. He was allowed to practice on a typewriter and for the first time had an opportunity to hear dictation. With his acquisitive sense and the pressure of time urging him on he very quickly became a star student. No one had advised him of the equal importance of developing his physical side, and three weeks of almost constant application and study with no proper time for sleeping caused his eyes to fail him. The head of the business school realized that his new student required outdoor exercise and persuaded him to go on the road as a typewriter salesman. The machine he had to carry with him was very much less efficient and more cumbersome than those now in use. It had a semicircular keyboard with 72 letters and weighed about as much as a trunkful of books. Lugging this up and down stairs and from town to town was "fine medicine" for a body suffering from indoor confinement, but was not so good for the spirits. There were few prospects for typewriters and sales were achieved only with the greatest of difficulty.

Won Competitive Post

There was, however, one transaction at this time that proved both spiritually and financially beneficial to Mr. Jones. The district attorney of Tioga County had announced that his office was in the market for a typewriter. The court reporter at the county seat was also a Remington agent and was confident of landing the coveted order. The district attorney had a sense of fairness and announced that he would hold a speed and accuracy test, the order to go to the best man. It probably looked settled in advance to him, as it was to be a contest between a professional writer of shorthand and a beardless boy yet to take his first bona fide business letter. The prize was such an impelling force that Mr. Jones determined to win it and walked out of the district attorney's office some hours later with an order for a $150 machine and "the thrill that comes once in a lifetime."

Such an occasional success was not enough to blind Mr. Jones to the fact that peddling typewriters was not much in the way of a life calling. He had gone back

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Elwood and Kettleman Unique Fields

Wells Yield Exceptionally High Gravity Oil From Vaqueros Sand. Micropalentology Proves Surprisingly Accurate

By L. P. Stockman

LOS ANGELES, Calif., Nov. 24.—The Elwood Field of Santa Barbara County and the Kettleman Hills Field of Kings County are both of relatively recent discovery, but each will ultimately become an important factor in state production. These two fields, in many respects quite similar, yield exceptionally high gravity oil. Production in both areas is coming from the Vaqueros, and although Kettleman Hills requires deep drilling approximating 7,200 feet, substantial production is secured in the Elwood Field around 3,400 feet. Three wells have been completed in the Elwood Field since discovery by the Barnsdall a few months ago, and this trio is yielding a little better than 10,000 bbls. of clean 39.5 gravity oil daily. No. 2 Bell Luten, the second well finished, was completed November 3, the initial daily production being officially recorded at 4,000 bbls. The top of the oil sand was encountered at 3,329 feet and a penetration of 74 feet was taken. The well came in without being either swabbed or bailed and cleaned itself of mud and water within 15 minutes. No. 1 Doty, the most recent completion in Elwood, is 1,550 feet southeast of the discovery. Spud was made on October 8 and the well was put on production November 10, a total elapsed time of 33 days. During the first 24 hours it tanked 4,061 bbls., but built up next day to 4,106 bbls., the oil being clean and testing 38.9 degrees A.P.I. This well responded exceptionally well on completion as the swab was only run four times. Oil sand was picked up at 3,268 feet and 118 feet of penetration taken put the bottom at 3,386 feet. No. 1 Elwood Acres is one of the most interesting drilling projects at present as it is approximately 1 mile due east of No. 1 Bell, the discovery, which is along the ocean front. Oil sand was encountered in No. 1 Elwood Acres on October 26 at 4,359 feet and an additional 43 feet of sand was opened up before deciding to make a production test. The sand is the same Vaqueros oil sand which has proven so highly prolific in the three producing wells to the west. No. 1 Elwood Acres was recently put on a production test, but an ineffective water shutoff precluded a satisfactory completion. Remedial steps have already been undertaken and an additional thickness of oil sand will be opened before the well is again tested. One of the most interesting features in connection with development work at Elwood is that substantial production is being secured from an unusually small penetration in the oil sand. The Barnsdall and Rio Grande interests, which appear to control practically all of the potentially productive acreage in the Elwood Field, are conservatively developing their joint holdings. The potentialities of this field have not yet been defined as the thickness of Vaqueros oil sand has not yet been determined.

The limited amount of information available tends to indicate the existence of a major fault having for its surface trace a drainage channel running easterly from a point in close proximity to No. 1 Bell, the discovery. It seems likely this is a hinge fault with the point of hinging somewhere close to the shore at the west end of the Bell Luten ranch. There appears to be a slight displacement between Nos. 1 and 2 on the Bell ranch as many fractures and vertical breaks were present in the shale cores located immediately above and resting upon the oil sand in the latter. Cores from No. 1 Elwood Acres, a little over a mile eastward, have proved a displacement along this fault of at least 700 feet, the downthrow side being to the north. It is possible a through anticline exists under the ocean a short distance west of the Bell Luten ranch and that this anticline breaks along its axis just off shore into the hinge fault mentioned.

The Elwood Field is probably somewhat unique in that development work has combined the most modern methods. All wells have been carefully cored and minute records maintained. Three of the wells drilled have been surveyed to determine the underground course of the holes and micropaleontological study of the cores has been carried through as a part of all drilling operations. Drilling equipment used includes some of the latest electrical drilling equipment and the newest type of derrick has been employed. In correlating between the wells drilled thus far micropaleontology has proved especially valuable. From a study of foraminfera by W. M. Smith the depths of oil sand in No. 2 Bell, No. 1 Doty and No. 1 Elwood Acres were estimated with surprising accuracy, particularly in view of the newness of the field and the limited time for study due to the speed with which the wells were drilled. In the case of No. 2 Bell, the second well finished, two alternate depths were estimated for the top of the sand, 3,252 feet and 3,324 feet. The oil sand was encountered at 3,329 feet. In No. 1 Doty the projected depth was placed at 3,260 feet and the top of the sand was found at 3,268 feet. In No. 1 Elwood Acres it was estimated the oil sand would be encountered at 4,383 feet. The bit penetrated the oil sand at 4,360 feet. This correlation by micropaleontology also corresponded nicely with lithology, with

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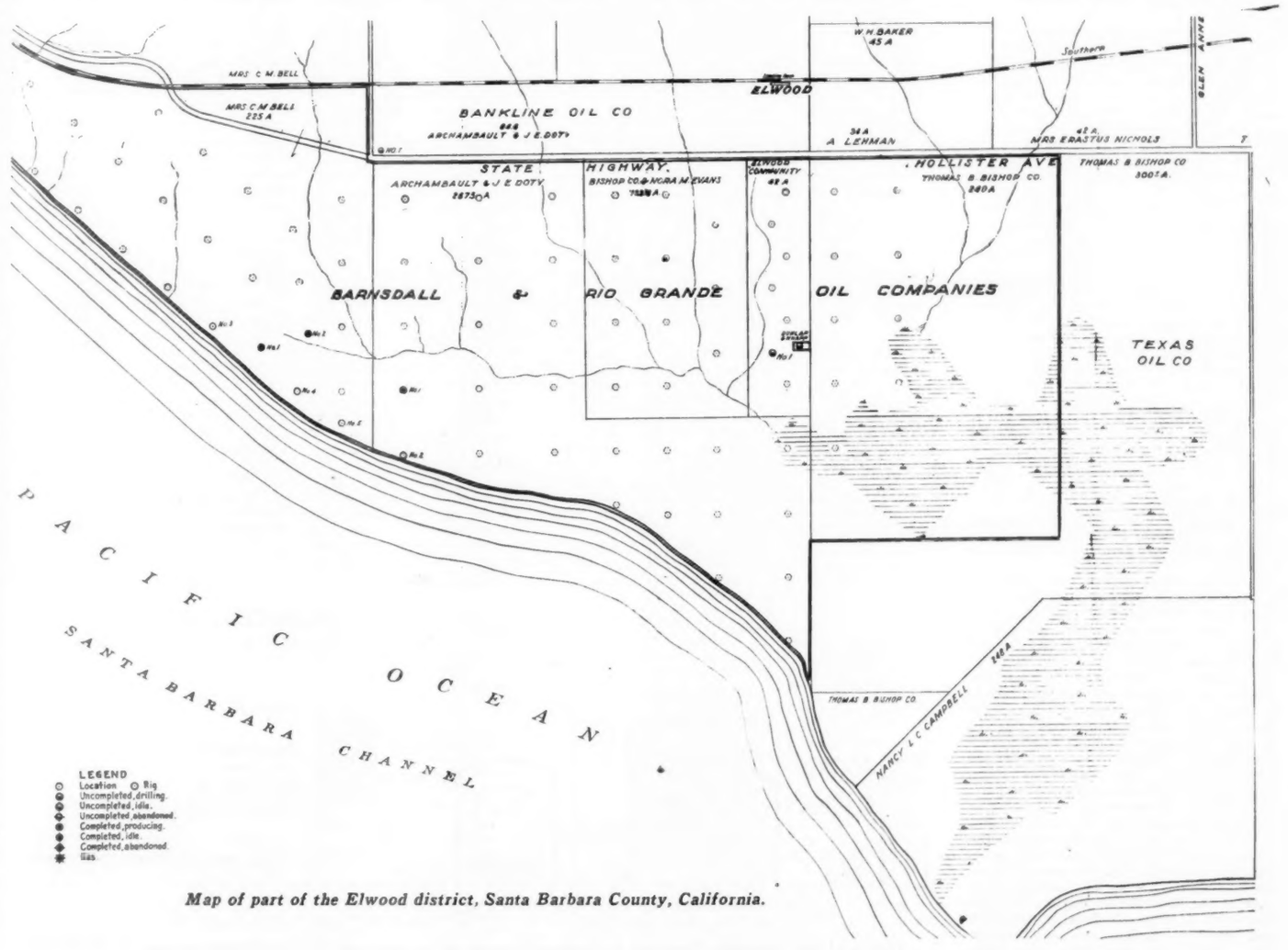

Map of part of the Elwood district, Santa Barbara County, California.

Scientists Discuss Coal and Petroleum

Second International Conference Attracts Representatives From 20 Countries. Combination Coal and Oil Company Forecast

By Special Correspondent

PITTSBURGH, Pa., Nov. 24.—The close interrelationship that exists between the oil and coal industries was again emphasized during the Second International Conference on Bituminous Coal which closed today at the Carnegie Institute of Technology here. That oil men, at least, are alive to the new "alliance" between the oil and coal industries was indicated by the statement of Dr. Walter F. Rittman, professor and head of the Department of Commercial Engineering, Carnegie Institute of Technology, to the effect that "one can no longer be satisfied to be a coal man or an oil man. One or the other must know what is going on in both industries."

"At this conference," Professor Rittman pointed out, "one speaker tells how to make oil from coal and another tells how to make coal from oil. Bergius tells us how to make gasoline from coal, and a group of experts tell us how to make low temperature tar into gasoline motor fuel."

According to Professor Rittman and other oil men who attended the coal conference, it is more evident than ever that the future may see an integration of the coal and oil industries because of many phases of similarity, and that large corporations will be engaged in a combination of the oil and coal industries to give to the public solid, liquid and gaseous fuels from a variety of sources.

Interest in By-products

Of necessity, according to a general impression, this group will be interested in the by-products not only from coal but from oil as well and which, in many cases, are common. For instance, it is pointed out, large oil companies today are manufacturing alcohols, etc., from petroleum gases while the same products together with many others may be made from coal.

More than 1,800 scientists and engineers from 20 different countries attended the coal congress and the oil industry of the United States was well represented. It was regarded as significant that both George S. Davison, president of the Gulf Refining Co., and Walter C. Teagle, president of the Standard Oil Co. of New Jersey, took active part in the proceedings as well as serving on President Thomas S. Baker's advisory board.

Liquefaction of coal, which was featured at the conference in 1926 through the presentation of the Bergin process by Dr. Friederich Bergius himself and which has reached commercial proportions in Germany, was again a major topic of discussion at this year's sessions. The conference this year, however, was marked by doubt of the value of coal hydrogenation as well as by favorable comment.

Contrary points of view were presented by A. Guiselin, secretary general, International Petroleum Commission, Germany, who questioned the necessity of "trying to liquefy coals and lignites but to give them reactive properties by proper process of carbonation"; and Dr. Jacobus G. Aarts, director of the Private Institute of Technology, Dongen, the Netherlands, who told the conference of a new fuel known as "Carbonalpha," for which he claimed "the finest imaginable structure, low combustion point, very great lubrication power."

Favorable discussion of coal liquefaction was presented by Dr. Carl Krauch, a director of the I. G. Farbenindustrie, which controls the German rights to the Bergius process; Dr. F. zur Nedden, another German; R. H. Crozier, manager of the Mineral Oils Extraction, Ltd., England; J. Ivon Graham, of the Mining Research Laboratory of Birmingham University, England; and Andre Kling, director of the Municipal Laboratory of the city of Paris. Dr. Krauch's paper on "Catalysis Applied to the Conversion of Hydrocarbons," was considered by many delegates to be the most outstanding contribution of the conference.

Consider Motor Fuel

Special interest was shown at this conference on the question of motor fuel. A novelty in this connection was the internal combustion engine for powdered coal, invented by Rudolph Pawlikowski, of Gorlitz, Germany. This engine, according to the opinion of many delegates has merely an academic interest for this country at the present time, but may be of practical use some years from now.

Experiments with pentane—described by the author as a chemical "imp" in the motorist's gasoline which causes motor "knocks"— was explained by Paul Dumanois, chief engineer of the French air service. M. Dumanois separated gasoline into its individual chemicals. He used pentane and air together to learn what this element does in an engine. For one thing, he said, he found that pentane explodes with such tremendous force as to contribute to the knock. Dumanois said that mixing pentane with tetraethyl reduced the violence of explosion and presumably the knock tendency. Pentane, he said, showed up on both sides of the ledger in forming the troublesome carbon in engines. At some temperatures and pressures, however, it made carbon, while at others it left no trace.

A valuable use for the poisonous carbon monoxide of automatic exhauts was forecast by Jean Delorme, director of the ammonia department of the Society "L'Air Liquide," Paris, France. "Carbon monoxide," he said, "which has been hitherto considered as a catalyst poison may even be considered as a valuable raw material. Through reaction with hydrogen, it leads, for instance, to methyl alcohol, a form of denatured alcohol." M. Delorme said ethylene from the new process may be used to manufacture antifreeze mixtures and that a chemical known as methane soon will be promoted to the dignity of a raw material and used perhaps in making synthetic fuel.

Use of Gas in Automobile

Discussing gas and tar industries in France, Jean Bing, Paris, called attention to the use of gas for propelling camions and heavy trucks. He said: "Another new field for the use of gas is appearing in the automobile. Coal gas may be used in ordinary motor cars. For many years gas has been used by the most important French car builders for running their motors in bench tests. Use of gas on the road is possible. The difficulty is to stock gas. The risk of explosion is due to the presence of oxygen in gas and the possible reaction either with hydrogen or methane at certain pressures has been proved not to exist at pressures up to 2,000 pounds per square inch if oxygen contents of the gas were less than 8 per cent. As the oxygen content is actually less than 4 per cent, use of compressed gas is possible.

In a paper "Pressure Electrolysis; Power and Fuel Oxyhydrogen in the Internal Combustion Motor," Dr. J. E. Noeggerath, of Berlin, said: "The transformation of coal into hydrogen for various purposes by means of the electric current fed into the pressure cell produces an especially flat rectangle for the chemical application of coal. Where mechanical energy is gained directly by the use of electrolysis the following may be said: While the great discoveries and inventions of Patart, the I. G. Farbenindustrie, Goissen and Fischer and especially of Bergius have enabled us to transform the heavy oil components of the crack processes into motor-ready oil by hydrogenation in big plants, the electrolysis processes in question make the heavy oil motor ready even for the normal high speed gasoline motor, and this is done, not in big plants, not even through any change in motor design, but in the carburetor itself, thereby increasing the application of the inventions of these great pioneers in the field of hydrogenation.

"Aside from the economic benefits involved by the use of oils instead of gasoline in motors, safety will be increased. I, for one, hope for instance that the burning up of passengers in the airplane service will become a regrettable incident of the past."

F. G. Tryon, economist of the Bureau of Mines told the coal men why they have had such a lean time lately. Coal demand used to grow regularly every year, but since the World War it has stopped growing, due to oil and other competition and to such things as the remarkable efficiency of new locomotives.

Dr. David White Speaks

As for oil, Dr. David White, of the geological survey, Washington, presented a map showing many places where it would be useless to hunt for oil, but he refrained from saying where oil was. Doctor White urged the conference not to lose sight of the fact that in America, and for that matter, in the world as a whole, oil deposits are limited and that they should be conserved as much as possible.

J. Ivon Graham of the Mining Research Laboratory at Birmingham, England, describing plants for adding hydrogen to coal and getting a liquid fuel like gasoline, said large quantities were produced which could themselves be converted into liquids. These are useful as benzine and antifreeze mixtures for automobile radiators.

In his paper, "Some New Aspects of the Economics of Coal," Dr. Jacobus G. Aarts, director of the Private Institute of Technology, Dongen, the Netherlands, described a new fuel which he hopes will eventually take the place of gasoline in automobile engines. The Aarts process consists of changing coal into carbon dioxide, then the latter to carbon monoxide and this into carbonalphine and carbon dioxide. The final carbon dioxide would be used again in the next batch of coal to help produce more carbonalphine. For the new fuel, Doctor Aarts claimed "the finest imaginable structure, low combustion point and very great lubrication power."

A continuation and expansion of our national prosperity will doubtless bring rapidly increasing use of oil burners for domestic heating for which there is a potential demand, according to authoritative estimate, of at least 250,000,000 bbls. of fuel oil per anum, J. N. Vandegrift, research engineer with the International Bitumenoil Corp. said during the conference. This would bring our total oil consumption in excess of 1,000,000,000 bbls. As the United States possesses one-half of the world's coal supply and only one-twelfth of the known reserves of petroleum, it emphasizes the importance of making coal and its by-products available in the form of smokeless fuel, as well as oil for domestic as well as industrial purposes, said Vandegrift.

Oil From Wood

Oil from wood is a laboratory accomplishment, Dr. Friederich Bergius of Heidelberg told the conference. Oil from wood, however, was not the result sought by Bergius. Rather it developed in experiments to make artificial coal from cellulose and lignin in an effort to learn more of the structural nature of coal. Bergius has developed a method for making artificial coal by hydrogenating cellulose and lignin under pressure. The lignin is obtained by treating wood with hydrochloric acid.

This artificial coal, Bergius said, produces oil containing considerable quantities of aromatics. The experiments, he said, show that the artificial coal may be very closely related to natural coal and that, therefore, it is more than likely a considerable proportion of natural coal is derived from cellulose.

Dr. F. Zur Nedden, secretary of the German National Coal Council, asserted that in the improvement of coal processing lay one of the most attractive ways of bettering the quality of the energy consumed in the world, and that only by improving qualities of things for a while could the world again reach a balance

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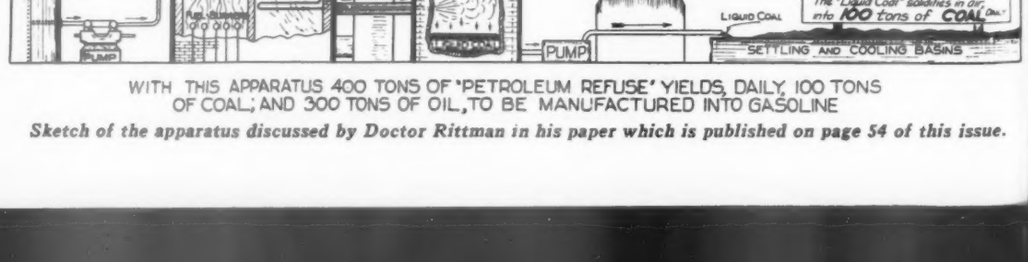

MAKING COAL OUT OF OIL
COAL IS NOW A BY-PRODUCT OF WASTE-OIL REFINING
SMOKE STACK
The COIL
A Continuous Coil of 3" steel pipe having a total length of ONE MILE
OIL-CONVERTER FURNACE
400 TONS OF PETROLEUM REFUSE
TANK
PUMP
850° TO 900° FAHRENHEIT
OIL VAPOR
SEPARATOR
WATER OUTLET
COLD WATER INLET
CONDENSER
DAILY OUTPUT
300 TONS OF "RECOVERED OIL" TO BE MANUFACTURED INTO GASOLINE
The "Liquid Coal" solidifies in air into 100 tons of COAL
LIQUID COAL
PUMP
SETTLING AND COOLING BASINS

WITH THIS APPARATUS 400 TONS OF 'PETROLEUM REFUSE' YIELDS, DAILY, 100 TONS OF COAL; AND 300 TONS OF OIL, TO BE MANUFACTURED INTO GASOLINE

Sketch of the apparatus discussed by Doctor Rittman in his paper which is published on page 54 of this issue.

George Dye Pins Faith to Hard Licks

Whatever of Luck Vice President of Wilcox Company Has Had He Attributes to Habit of Putting His Heart Into His Job

By Thomas F. Smiley

They all have their high hours, of course, and George A. Dye, vice president of the H. F. Wilcox Oil & Gas Co., has had as many as anybody. His highest, towering dizzily above all the rest, was the one he experienced when at the age of 17 he won second place in a messenger boys' 25-mile bicycle race and received as a prize a gorgeous black-and-yellow sweater. That was in Buffalo, N. Y., back in 1899. Life couldn't be the same after treading the mountaintops of exaltation like that and George began to see visions of greater things than delivering Western Union telegrams at 2 cents each, with $3.50 as a high mark for a week's work. He looked about for some position more befitting the endowments of a person who could win a black-and-yellow sweater in a 25-mile bicycle race. He found it in the shipping department of the Niagara Machine & Tool Works.

In this new field George's salary started at $6 a week and in the course of time it soared to the intoxicating height of $11. He reveled in the title of assistant shipping clerk. While he was engaged thus in the assisting industry a bacillus typhosus, concealing its identity perhaps by holding its name behind its back, stole upon him unobserved and gained access to his interior works. The doctor who felt his pulse and looked at his tongue announced the boy had typhoid fever. When George emerged from this experience, skinny and hairless, the doctor said he would have to get outside work. His professional duties as assistant shipping clerk were too confining, it seemed. So George abandoned the career whose pathway had gleamed so brightly before him, abandoned the $11 per and the impressive title and set out forthwith to demonstrate to a soulless world that you can't keep a good man down.

Yes, It's Queer About That 2

George was 20 now. He might get a railroad job if he only were 21, the minimum age for employes. Oh, well, he'd go around to the office of J. S. Brown, road foreman of engines for the Lake Shore & Michigan Southern (New York Central) Railroad and see what he could do. He filled out an application blank which contained among other things a place for the year of his birth. Now George was born in Buffalo in 1882, but when he wrote down the year on the dotted line he must have become careless, especially when he got to the 2. Funny thing about that 2. It didn't look like a 2 at all. It looked for all the world like a 1. When he thinks about it now Mr. Dye feels certain that it really was a 1.

Mr. Brown unhesitatingly read the date "1881" and crediting George with being 21, gave him a job as fireman on a freight train. George didn't like to tell Mr. Brown that a mistake must have been made, that he was not 21, but only 20. Mr. Brown was a busy man and might get all nervous and worked up over a mistake like that, so George decided not to say anything about it. He just took the job.

The run was from Ashtabula to Oil City, Pa., and to Youngstown, Ohio. And no kidding, young Dye made good. He had a way of doing that. He was firing on passenger trains at the end of two years, and just four years after he began railroading he was promoted to engineer. He was the youngest promoted engineer on the New York Central lines, being only 24 years old. (Of course, on account of that unfortunate error in making out his application blank he was 25 on the railroad records.)

Men much older than he fired for the young engineer. George's youthful appearance led to amusing incidents. Once a conductor came up to the engine before the train pulled out of the West Seneca yards in Buffalo to see that his watch agreed with that of the engineer. Addressing the older of the two men he found there, he asked, "What time have you?"

"I haven't got a watch," was the reply.

"Haven't got a watch!" rasped the conductor. "How the hell do you expect to run the train?"

"I guess the engineer's got one."

The conductor then turned to young Dye, whom he had mistaken for fireman, and exploded, "Great Scott! A kid running the engine and an old man firing!"

On the Twentieth Century Limited

After his promotion to engineer the young railroad man, in accordance with custom, served as either engineer or fireman as occasion demanded. Indicating the regard in which his efficiency was held by his superiors, he was chosen to serve as fireman on the Twentieth Century Limited when that crack 18-hour train was put into service between New York and Chicago. To this day Mr. Dye makes no effort to conceal his pride over the fact that he was assigned to a run to which only the most skilled men on the pay roll were called. After working alternately as engineer and fireman for three years, Mr. Dye was assigned to a regular run as engineer, in which capacity he continued until he quit the railroad to enter the oil business in 1916.

Other railroad men referred to Mr. Dye as a "lucky dog." On at least three occasions fate, luck, or whatever you're minded to call the force that determines human destinies, saved him from death or terrible injury.

Once while Mr. Dye was rooming in Ashtabula and firing a freight train, he traded runs with Guy Amsden, another fireman, to enable Amsden to stay over in Ashtabula and call on his sweetheart. Two hours after Amsden started out on the other's run he was brought back dead. The locomotive had blown up.

Another time when Mr. Dye changed runs with a fireman the engine was sideswiped and overturned. The fireman was caught under the engine and cooked to death by escaping steam.

One night Mr. Dye, who had married and was residing in Buffalo, remarked to Mrs. Dye, "I feel like laying off tonight."

"Get Harry Mills to take your run," suggested Mrs. Dye. "He often asks you to trade."

Acting on the suggestion, Mr. Dye arranged with Mills for an exchange. At Bayview Junction, 5 miles from Buffalo, the passenger train on which Mr. Dye would have gone out in the regular order of things encountered a snowstorm and had a collision with a freight train. Mills and his engineer were taken to a hospital suffering from frightful injuries which kept them confined for weeks.

In the meantime Mr. Dye was keeping an eye out for broader opportunities than appeared on his horizon as a railroad man. In this connection he recalls Nate Wood, an engineer of Cleveland, with whom he served as fireman on a main line passenger run. Besides being an engineer Wood was a writer of short stories, an osteopath and he conducted two jewelry stores, one in Cleveland and one in Portland, Ore. "Be something else than a railroad man," Wood used to urge.

Well, He Was Going To

Mr. Dye was planning to do that very thing, though his predilection did not turn to osteopathy, fiction writing or running jewelry stores. As a matter of fact, the oil business intrigued him. In 1911 Mr. Dye had gone to Oklahoma to visit N. T. Langdon, his father-in-law. In Tulsa he became acquainted with H. F. Wilcox. The latter got Mr. Dye interested in oil. This interest grew until in 1916 he resigned his job with the railroad, moved to Tulsa and joined Mr. Wilcox. His work at first consisted mainly of buying leases, but in the course of two years he did some kind of work in almost every branch of the oil business, learning the fundamentals of oil production and laying the foundation for work he was to do later.

Mr. Wilcox already had become well known in the oil business. He had been the first to get production below the top of the Mississippi lime in 1914, bringing in a 2,400-bbl. well on the Gracie Call farm near Bixby in the second break in that formation at a depth of 2,100 feet. This producing sand has been known since as the Wilcox.

In 1918 Mr. Wilcox and Mr. Dye organized the Homer F. Wilcox Oil & Gas Corp., with the former as president and the latter as vice president, offices which they have held respectively ever since. The name was changed afterward to H. F. Wilcox Oil & Gas Co. Mr. Wilcox had started with two rooms in the Palace Building, Tulsa, later taking three in the Mayo Building. When the company was formed it took six rooms in the Wright Building. Afterward it rented eight more in the same building, giving it 14 altogether. It soon outgrew these quarters too and in 1920 it moved into its own new building on Sixth Street, Tulsa.

In the first year of its operation, the company produced 62,450 bbls. of oil from four producing leases of about 400 acres, and it had 15,000 acres under lease. In 1923 it produced 2,317,031 bbls. from 42 producing leases of about 600 acres, and it had 120,000 acres under lease. In 1927 it produced 2,807,748 bbls. from 62 producing leases of about 15,000 acres, and it had 323,000 acres under lease. Its operations cover Oklahoma, Kansas, Texas, Arkansas and Louisiana.

Luck May Help, but—

Few men growing up in vocations as foreign to the petroleum industry as is the engine cab have gained such swift success in oil as Mr. Dye did. Some may say that the benign star which led fellow railroad men to call him a lucky dog followed him into the oil business. And yielding to the fatalism that persists in humankind, it may be admitted here that the temperamental goddess who presides over drilling operations has been right generous to Mr. Dye. But it won't do to let it go at that. Mr. Dye himself obviously puts more faith in hard licks than he does in kindly chance. If he has

(Continued on Page 159)

JUST FIGURE IT OUT FOR YOURSELF

Taking a swift, sketchy survey of George A. Dye's career to date, one easily might jump to the erróneous conclusion that preparations commonly recommended to young men who contemplate entering the oil business are needlessly prolonged and expensive; that as a matter of fact you can hop right into it from wherever you happen to be and score an instant success.

GEORGE A. DYE

Such a notion would be predicated thoughtlessly on the steps—if you can call them steps—in Mr. Dye's rise to a leading place in the petroleum industry. First, messenger boy, darting about on a bicycle through mazes of traffic delivering telegrams. After that, successively, assistant shipping clerk, railroad fireman and railroad engineer. Then, following two years of intensive actual work in the oil business, vice president of the H. F. Wilcox Oil & Gas Co. And he's only 46 now. When this man set out to go somewhere he doesn't appear to have wasted any time in the process of getting there.

It seems to bear out the truth of that sage deliverance to the effect that you can't always tell, and of that other one, equally profound in its philosophic content, that there are more ways of killing a cat than by drowning it. That is to say, a man's first job is not necessarily prophetic of what his last one is going to be and there is no set formula for attaining success in the oil business or any other.

Mr. Dye himself offers no formulas to anybody. He has extracted a lot of fun out of every job he ever had. To each in its turn he gave the best that was in him. And there you are. Get a formula out of it if you see one.

Discussions of Engineering Problems

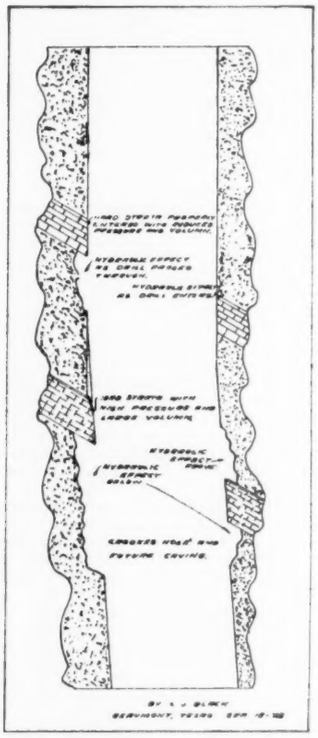
EDITED BY R. VAN A. MILLS, PETROLEUM ENGINEERING EDITOR

DISCUSSION OF CROOKED HOLE PROBLEM

By L. J. Black of Beaumont, Tex.

In discussing the hydraulicking effects of large volumes of circulating fluid under high pressures, in causing crooked holes, we are inclined to the belief that this is the cause of most crooked holes, and is responsible for the loss of many holes in drilling. The sketch attached fully illustrates our idea of the effect of hydraulicking. We are, also, of the opinion that the hydraulicking effect is greatest at the point of contact of the bit with a hard stratum. It is generally conceded that very few hard strata lay level, but dip in some direction from a high point or in several directions from the top of a dome. At the time the bit strikes this hard stratum, the natural tendency is to follow the dip, and the use of high pressure and a large volume of circulating fluid at this particular point, aids in causing the bit to follow the incline.

The cutting action of the fluid would naturally be increased because of the time



Sketch illustrating the hydraulicking effects of fluid circulating under high pressure.

element, as the bit makes slower progress into the hard formation, causing the hydraulicking effect to be of a longer period. In drilling through a soft formation, the only effect would be to feed the bit down as rapidly as the pumps would remove the formation, and the walls of the hole would not be properly mudded, and would continue to enlarge by caving or by the cutting action of the grit-laden fluid in its rapid flow up the hole. This inclines us to think that hydraulicking is largely responsible for crooked holes, and also for enlarged holes at soft spots, which removes the support from under the hard strata, causing them to break down, and also removes the side support away from the drill pipe and stem, causing them to twist off.

Referring to the weight of muds. Ten and one-half pounds, we think, is a high average. The writer weighed with a United States standard gallon measure 50 samples of mud from as many different drilling wells, and in three separate fields in the Gulf Coast, and the average was found to be a trifle less than 10 pounds; the highest was 13¼ pounds and the lowest was 7¼ pounds. In territory where there is considerable gas, it is not uncommon to find the mud weighing less than clear water, because of the entrapped gases. The same condition can be brought about, to a lesser degree, by running the foot valve too close to the top of the mud, creating an eddy, and entrapping air in the mud through the pump suction.

Editor's Remarks

Several prominent engineers have expressed disagreement with the view that hydraulicking is an important factor in the drilling of crooked holes. Their opinions have been expressed in verbal discussions but not in print. The editor has requested the engineers to publish their views in these columns for consideration and discussion by others. Some of our most practical and experienced contractors attribute much importance to hydraulicking as evidenced by Mr. Black's discussion. We are especially glad to hear from them.

There is one point in Mr. Black's discussion that will doubtless be challenged. He pictures the deflection of the bit caused by encountering hard formations as being in a down dip direction. Experience seems to have proven, however, that the deflection caused by encountering a hard formation is often toward a right angle to the hard bed. H. B. Goodrich in his paper upon the crooked hole problem presented before the Geological Society of Tulsa in December, 1926, and published for the first time in The Oil and Gas Journal of November 15, 1928, described this type of deflection as follows:

"It is well established that when a rotated bit meets a hard, dipping, stratum the resistance is on the up-side. The core barrel or attached drill pipe bends under weight and bows, so that the cutting surface is inclined toward a right angle to the resistant layer. The same thing should theoretically occur in cable tool work, although not to the same extent."

TORQUE INDICATOR PROBLEM

Discussed by J. T. Hayward
Of Ploesti, Rumania

I read with great interest the discussions on Engineering Problems in the section of the Journal edited by you and it is the section that I turn up first when the paper arrives. Unfortunately distance makes it very difficult to take any part, as by the time the Journal arrives here and mail can be got back to you, some six weeks must elapse and the matter under discussion will have changed.

A case in point is this question of crooked holes, differential control, etc. In the September 13 issue of the Journal, your correspondent, Hollis P. Porter, laments the absence of a device for measuring the torque in the drill pipe during drilling. I believe that this can be done in a very simple and inexpensive manner. In any steam engine the torque is proportional to the mean efficiency pressure in the cylinders and since the gear ratio between the engine and table is constant, the torque in the drill pipe is also proportional to the M.E.P. It is, therefore only necessary to connect a pressure gauge marked in a suitable manner to the cylinders, and mount it close to and in full view of the driller, for him to know the stress he is putting in the pipe. As the cut-off in the usual drilling engine is constant, a single connection from the steam manifold between the engine and throttle will give quite accurate enough results. The gauge should be large and sensitive and a mark can be made on the glass at a point representing a suitable torque for the type and condition of the drill stem in use. During drilling the finger of the gauge is kept close to this mark by means of the brake. The above simple arrangement will be found to give very remarkable results.

The same principle can be applied to give full automatic feed and one manner of carrying it out is as follows: The standard rotary draw works and engine are used. In addition to the main engine a small auxiliary twin engine with 4-inch by 4-inch cylinders is required which during actual drilling is geared through a very low gear (say 100 to 1) to the drum shaft. During drilling the throttle of this small engine is wide open but the position of its reverse lever is controlled by a diaphragm connected by a small pipe to the main engine steam manifold between engine and throttle. The auxiliary engine will therefore operate according to the M.E.P. in the main engine and consequently to the torque in the drill pipe. When the torque is correct the reverse link of the auxiliary engine will be in midgear and the drum held by the internal friction of the low gear. When the torque alters the small engine will feed the pipe down or pull it up as required.

It will be seen that the above arrangement does not depend upon balancing the torque in the drill pipe against its weight, that is against a variable. Its cost and weight should be less than that of a differential gear.

Remarks by Editor

The number and quality of these excellent discussions upon various phases of the crooked hole problem are in keeping with the importance of drilling straighter holes. The foregoing discussion by one of our technical readers in Rumania is of particular interest because Mr. Hayward presents a clear picture of one relatively simple solution of the weight control and torque indicator problem where the prime movers are driven by steam. It is also interesting that W. R. Cummings of Breckenridge, Tex., has developed a steam pressure weight control and torque indicator system similar to that outlined by Mr. Hayward. Also at least one of the large manufacturers of rotary drilling equipment has conducted extensive experimental investigations along these lines.

Since the articles upon the crooked hole problem appeared in The Oil and Gas Journal of August 23, 1928, several of the larger technical associations have undertaken studies of the problem with a view toward drilling straighter holes and more accurately interpreting the data made available by wells already drilled. It is the opinion of many engineers and geologists, and the writer agrees with them, that the general occurrence of crooked holes and the magnitude of lateral drift and erroneous depth measurements have been established beyond any possible doubt. Little is to be accomplished through the further compillation of data upon these subjects unless the work be pursued from an engineering and geological research point of view for the purpose of developing and applying methods of drilling straighter holes and for the purpose of developing and applying methods for the more accurate interpretation and use of subsurface data based upon well logs.

The provinces of our larger technical associations in research work upon the crooked hole problem have been defined by F. H. Lahee in the following notes relating to his investigations of the problem for the American Association of Petroleum Geologists. It is hoped that the many companies and individuals interested in the crooked hole problem will co-operate with Doctor Lahee as fully as possible.

RESEARCH PROVINCES

Discussed by F. H. Lahee
Dallas, Tex.

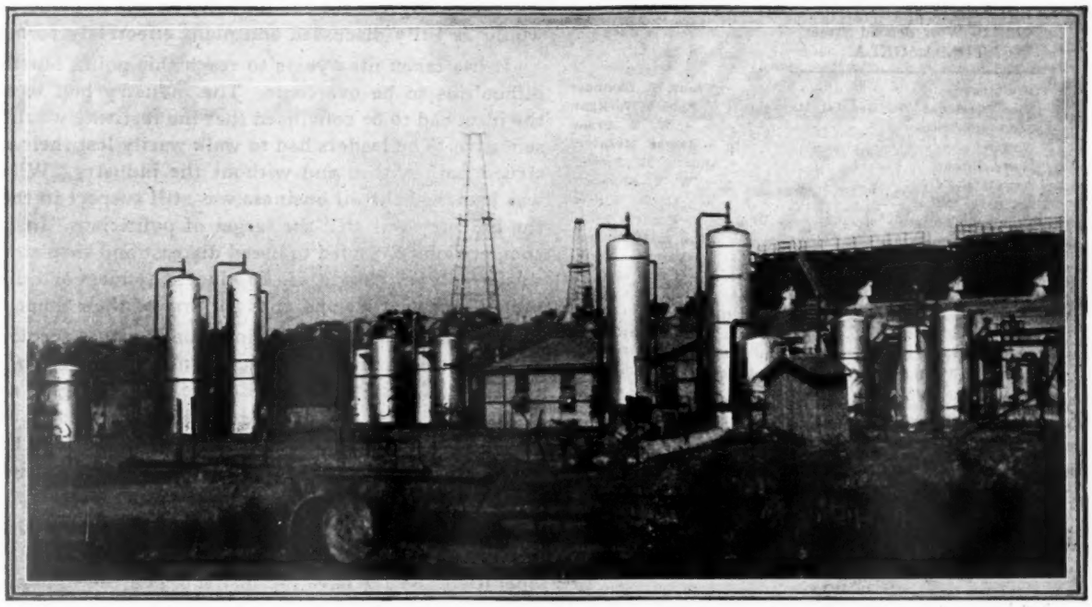
The fact that holes drilled for oil may not go straight down, but may deviate from the vertical line which they are intended to follow, has long been recognized by many of us whose interests are associated with the production of petroleum; but perhaps only recently, within the last year or two, has the significance of this condition become generally appreciated. I believe that we are only just entering a period during which the study of crooked holes will become of paramount importance in the oil industry.

When we learn that holes, thought by the drillers to be straight, may be inclined 30 or 40 degrees from the vertical, we are certainly brought face to face with a problem of far-reaching consequence. And this problem becomes the more serious, the deeper we drill for oil. No one can deny that the industry must find better means of drilling holes more nearly vertical, of measuring the deviation of holes which turn from the vertical, and of correcting for such deviation with some degree of accuracy as to amount and direction of angle of deviation from the vertical.

I feel that research aimed to develop methods of correcting crooked holes and methods of drilling holes more nearly vertical, belong to the A.P.I. and the A.I.M.E. To the A.A.P.G., on the other hand, belongs the duty of studying and measuring holes already drilling or drilled, with a view toward developing more accurate methods of interpreting and applying well log data. We, as geologists, are vitally concerned with this matter, for, upon our knowledge of the actual position of the hole depends our success in correctly correlating the subsurface formations. Especially must we know this in the case of fault structures and salt domes and anticlines with steeply dipping flanks. The bottom of a hole that acquires an inclination of 30 degrees from the vertical in a supposed depth of 4,000 feet may be far short of 4,000 feet in actual depth and may be several hundred feet from a point vertically below its opening at the ground surface.

REMARKS BY EDITOR

The wide interest shown in the crooked hole problem is exemplified not only in the papers and discussions in The Oil and Gas Journal but in those presented before various technical associations. Local engineering and geological societies in different parts of the country are working on it. The subject aroused a thorough discussion at the recent meetings of the Mid-Continent section of the American Petroleum Institute Division of Development and Production Engineering, in Tulsa. The paper that Dr. F. H. Lahee of the Sun Oil Co., Dallas, Tex., is preparing for presentation at the forthcoming meetings of the American Association of Petroleum Geologists in Fort Worth, Tex., next March should also throw much interesting light upon this problem from the geologist's point of view. In the big task of collecting, assembling and analyzing data upon the crooked hole problem he should receive the fullest possible co-operation.



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MEMBER AUDIT BUREAU OF CIRCULATIONS

GEORGE H. JONES

There is genuine and general sorrow among those who had the good fortune to know him, over the untimely passing of George H. Jones. It was a winning personality, simple, natural, modest, that gripped men to him, the officers and fellow workers of the great corporation which he served so signally for so long, the leaders in finance and industrial and business enterprises with whom he had contact, and the neighbors back in the Oil City that he fondly regarded as his old home town. These mourn him as a friend.

To the wider circle in the oil and natural gas industries which knew of him as a leader George Jones was universally respected and esteemed for his career, his knowledge and his ability. His rise from the humblest environment, attained by sheer hard work and dogged determination, was an inspiring example and a demonstration that the chairmanship in the world's greatest oil corporation was open to merit.

It is sad to think that the driving power within the man which carried Mr. Jones from obscurity to power, enabling him to overcome the handicaps of youthful hardships, and to master the details of every task he encountered, finally, through force of habit, proved his undoing. The man who had toiled early and late through boyhood, youth and manhood had never found time to rest, to find that physical recreation and mental relaxation necessary to keep himself fit for his crowning work. When he was chosen to succeed the late A. C. Bedford his friends in the New Jersey corporation succeeded only with the greatest difficulty in persuading Mr. Jones to take a long needed vacation which he spent in a trip abroad, assuring him that a change of scene and release from the cares of business were needed to strengthen him physically for the responsibilities of his new position.

But it was not enough. He who had no other thought than work and duty could not alter his habit of life. When he was stricken in September he had not the physical resistance needed to pull through and, struggling bravely through a long illness, found rest at the comparatively early age of 56, when perhaps otherwise he might have had many fruitful years before him.

The oil industry can ill spare George H. Jones.

THE A.P.I. MEETING

The program for the ninth annual meeting of the American Petroleum Institute which is to be held at Chicago next week shows that the institute is realizing the hopes that it would ultimately become a congress for the industry in which principles and policies would be fully discussed and plans effectively formulated.

It has taken nine years to reach this point, but there were many difficulties to be overcome. The industry had to be won over to the idea, had to be convinced that the institute would be truly representative. The leaders had to walk warily lest their work be misconstrued both within and without the industry. When the institute was launched the oil business was still suspect in the popular mind, the industry was still the target of politicians. Inside the industry competition continued to breed distrust and suspicion. Co-operation was largely unthought of. Producers, refiners and distributors, individually or as divisions, thought first of their immediate interests.

Naturally, in such conditions the institute seemed as impractical and powerless as the League of Nations appeared in its initial stages to the warring statesmen of Europe. But changing conditions in the industry have been reflected in the institute itself. The progress of the industry in co-operation, between its various branches and between the units in those branches, has pressed principles and policies upon the institute which are today reflected in its program.

Among the subjects on that program are to be found unit operation, the code of ethics, public relations, legislation, and world co-operation. So far have the institute and the industry traveled from the more or less theoretical discussions of earlier days.

Oil men are finding their voice in these meetings of the institute and of other associations and frankly discussing their problems.

The report of the committee on the code of ethics will be of much greater interest than to marketers alone. Any movement that will eliminate or curb unfair practices, unwholesome methods, that will promote efficiency and stabilize values in the marketing end will prove of equal benefit to the producers and to the refiners.

As has been said before the producing and manufacturing divisions have been making phenomenal strides towards greater efficiency, but this advance has largely been canceled through failure to secure like efficiency in the distribution and marketing of petroleum products. The co-operation which has attained these results in the producing and refining branches has been absent from the marketing division where competitive tactics have involved the whole industry in needless losses.

In the struggle for volume of business, in the entrance of competitors seeking profits today regardless of the morrow, stability and permanence were often forgotten and ethics disregarded to the loss not only of those directly affected but the whole industry.

The same spirit of co-operation which brought order out of the chaos of competition in the producing and refining branches would have kept control of the market within the industry, would have avoided the throwing away of profit and the wasteful sale of products for less than they are worth to the industry or to the public.

To accomplish results the power of opinion within the industry must be marshaled and united against violations of sound business principles. Organization of some sort will be necessary to advance and crystallize this sentiment and influence.

World leaders of the industry have realized this, hence the movement for world co-operation in stabilizing the oil business, conserving against waste of oil and resources.

In the producing end opinion has progressed to virtual endorsement of unit operation as the practical plan for averting wasteful overproduction. Details remain to be discussed, practical and legal. The difficulties of state or federal legislation cannot be overemphasized. It is a step to be considered carefully.

Besides these questions of general importance the institute will continue consideration and action upon the programs of standardization, and uniform accounting. Development and production engineering and refinery technology, corrosion and transportation, will furnish topics for most of the technical papers to be presented, remarkable for both the number and variety of the subjects.

Ask a Man Who Knows!

Mr. Frank N. Smith has been associated with the Dresser business for thirty-six years.

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Purchasing Companies Discuss Proposal to Pay for Oil Monthly

Representatives of crude oil purchasing companies buying oil in Oklahoma and Kansas met in the Mid-Continent Oil & Gas Association rooms in Tulsa on Tuesday to discuss the proposal that oil purchases be paid for once a month instead of semimonthly as is the custom.

In Texas purchases are made on a monthly-payment basis, the checks being mailed to customers on the tenth day of the month for oil purchased the previous month. The proposal to adopt this plan in Kansas and Oklahoma was for the purpose of making the accounting uniform in the three States and to relieve the accounting department of a great burden made necessary by the semimonthly payment of a multitude of small accounts growing out of fractionated royalty interests on settled production.

The once-a-month payment plan was favored by the majority of the companies represented at the meeting, but a considerable number of purchasers were not represented and a committee made up of A. B. Chesbro of the Carter Oil Co., H. E. Meyer of the Prairie Oil & Gas Co. and Hayes McCoy of the Empire Pipe Line Co. was appointed to canvass the absent companies in an effort to obtain general acceptance of the proposed change. The committee will report back to a meeting to be held in December.

It is desired to put the new plan into effect after December 31. Rush Greenslade of the Gypsy Oil Co. presided at the meeting.

PRAIRIE STOCK SPLIT REPORTED PROBABLE

NEW YORK, Nov. 27.—A New York banking group, previously actively identified with the oil industry, is reported in financial circles to have acquired a large block of stock of Prairie Oil & Gas Co. and Prairie Pipe Line Co. Capital readjustment of the pipe line company of the pipe line company involving a reduction in par from present $100 is expected.

Subsequent reports mentioned Blair & Co. as purchasers of the Rockefeller holdings in the Prairie companies stated to represent 15 per cent.

Prairie Oil & Gas Co. stock, with a par of $25, was selling around $67 on Tuesday, while Prairie Pipe Line Co., par $100, was selling around $275 on the same day.

The Prairie Pipe Line Co. is doing the largest transportation business in its history. It is transporting around 210,000 bbls. of crude daily, not including the Gulf Pipe Line Co. of Mexia, Tex. south, which line is controlled by the Prairie organization.

The Prairie Oil & Gas Co. has a production of about 75,000 bbls. per day. Its gross production in Texas in the first nine months of this year was 4,470,850 bbls. and its net production in Oklahoma was 9,436,824 bbls. in the same period. In addition the Producers & Refiners Corp., owned by the Prairie Oil & Gas Co., had a net production in Oklahoma of 299,683 bbls. in the nine months. Prairie also has production in Kansas and Wyoming and is operating in California and New Mexico. It owns 52,000,000 bbls. of crude oil in steel storage; large gas interests in the Texas Panhandle and a large amount of undeveloped acreage scattered over the Mid-Continent area.

CURTAILMENT ENDORSED AT SANTA FE SPRINGS

LOS ANGELES, Calif., Nov. 24.—Santa Fe Springs operators representing 80 per cent of the Meyer zone production unanimously endorsed the proposed gas conservation measures to be undertaken at Santa Fe Springs and the Committee of Fifteen appointed several weeks ago was instructed to take such steps immediately as might be necessary to bring about the execution of this progressive conservation work. After a thorough discussion it was resolved that the conservation plan dealing with the repressuring of the Meyer zone as submitted by the Committee of Fifteen is approved by the representatives of the operators present and that the same be presented to all Meyer zone operators for execution and that they be invited and urged to become members of the proposed association.

Herbert R. McMillan, chairman of the Committee of Fifteen, read the detailed report of the committee outlining the deliberations and findings of this committee with respect to curtailment of production. After a general discussion of the plan of curtailment to be adopted, on motion by Herbert R. MacMillan and seconded by Joseph Jensen, a resolution was adopted approving the principle of conservation by curtailment and certain details by which this curtailment might be effected.

Only one change was made by operators in the report prepared by the Committee of Fifteen as it was the consensus of opinion that the proposed curtailment plan should continue in effect for 90 days instead of six months from the date set by the control committee for the beginning of the curtailment.

Over 350,000 Tons Of Line Pipe in Plans Now Coming to Head

By B. E. V. Luty

PITTSBURGH, Pa., Nov. 26. — Report has it that The Texas Corporation has placed an order for about 60,000 tons of line pipe for its line from Tulsa to Lockport, Ill., near Chicago. The recent report that the natural gas line from the Jennings Field, Zapata County, Texas, to Monterrey, Mexico, was placed has not been confirmed. It is understood, however, that the A. O. Smith Corp. received an order for a line to run to El Paso, involving 100 miles of 14-inch and 100 miles of 16-inch electrically welded pipe. Other lines talked of lately include the line from Wyoming to Salt Lake City and two lines to run from Louisiana to St. Louis, Mo., and Birmingham, Ala., respectively.

At a rough estimate there is 350,000 to 400,000 tons of line pipe involved in projects now coming to a head, or in inquiries now before producers. This makes a very important matter for the pipe mills. Frequently in the past at this time of year such line pipe business would come up and very close prices would be made, because as a rule the steel industry stands in need of extra tonnage to keep it going well through the winter, when some lines of consumption are off. The rail mills always look for winter rollings on that account. As matters look now, however, the pipe mills are in relatively easy position and they say they are going to secure profitable prices on such business as they accept.

Pipe and tube mill operations have decreased farther in the last fortnight, and may be estimated at about 75 per cent for the pipe and tube industry as a whole.

HUMBLE PLANS PIPE LINE FROM BOGGY CREEK FIELD

HOUSTON, Tex., Nov. 26.—A survey for the first pipe line outlet for the Boggy Creek Field on the Anderson and Cherokee County line (East Texas), was started the past week by the Humble Pipe Line Co. Construction on the line, which will be 8-inch, will start as soon as the survey is completed.

The line will extend to Groesbeck, a distance of approximately 60 miles, where it will connect with the Humble's trunk line to the Gulf Coast.

Boggy Creek in which there is a daily production (pinched in) of approximately 2,000 bbls. has been served until now only by a small line to loading racks at Frys Gap, 6 miles distant. The field is being developed by the Humble Oil & Refining Co. jointly with the Rio Bravo Oil Co.

HIGH SPOTS IN FIELD NEWS

CALIFORNIA

Barnsdall company's No. 13 O'Dea, Rosecrans Field, redrilled and deepened to 5,404 feet and, recompleted, is doing 2,050 bbls. of 37 gravity oil and 1,500,000 feet of gas.

Report of Committee of Fifteen on Gas Conservation in Santa Fe Springs Field endorsed by operators for 90 days.

Elwood Hills and Kettleman Hills to be important factors in state production.

Santa Fe Springs completed five new wells in the deep zone and started production upward. Probably 40 drilling projects to be finished before end of year.

OKLAHOMA

Greater Seminole area touched new low production when Seminole City Pool slumped below 40,000 bbls. on Tuesday.

State's production declined 2,405 bbls.

Mission area to be an air lift operation.

ILLINOIS

Well making 25 bbls. completed in western Illinois, across Mississippi River from St. Louis.

KANSAS

Second well in Sedgwick Pool, Sedgwick County, flowing at rate of 1,700 bbls.

COLORADO

Report that in Kelly Oil Co.'s No. 1 State, Section 36-14s-57, Lincoln County, eastern Colorado, high gravity paraffin base oil rises in the 8-inch casing 18 inches in 24 hours, temperature indicating oil is being forced up through cap rock by heavy pressure.

SOUTHWEST TEXAS

Joe Bruner Field most active spot in southwest Texas. Over 50 derricks in Caldwell County district. Formations puzzling.

Showing of oil in Blanco County, first drilled in that area.

MICHIGAN

Muskegon operators plan conservation of gas.

NEW MEXICO

Midwest company's well in Lea County flowed 912 bbls.

CANADA

Turner Valley's biggest completion is double open flow production of Royalite No. 4.

WEST TEXAS

High gravity pool probably opened by Pecos County wildcat, 14 miles south of Shipley and associates' well.

There was an 8,000-bbl. drop in West Texas production.

Late News from the Field

OKLAHOMA

The Greater Seminole area again touched a new low output when the Seminole City Pool slumped below 40,000 bbls. on Tuesday of this week. The output by pools was:

	Bbls.
Little River	101,790
Maud	5,919
Mission	1,247
Bowlegs	46,867
Earlsboro	76,315
Seminole	39,888
Searight	10,272
Total	*282,298

*Barrels from 1,278 wells.

In the St. Louis Pool, the Magnolia Petroleum Co.'s No. 1 Cherry-A, NE cor. SE NE, Section 26-7-4, is still declining and on Tuesday morning produced 497 bbls. which was cut 20 per cent.

In the Osage Nation of Oklahoma, a well on the Naval Reserve which was completed about one year ago was drilled deeper with good results. This is the Gypsy Oil Co. and Marland Oil Co.'s No. 1 Reserve, NE cor. SW, Section 22-24-7. The well was making 10 bbls. an hour on the air lift from a total depth of 2,904 feet. It was drilled 1 foot deeper, and the flow increased to 60 bbls. hourly. Drilled a second foot deeper, the flow increased to 100 bbls. an hour, and the first full day's gauge showed 1,687 bbls.

In Okfuskee County, John Cary and others' No. 1 Monarye, NW cor. NE SE. Section 29-12-10, was drilled 5 feet deeper into the Dutcher sand with a total depth of 2,937 feet. The well increased from 700 bbls. to 1,320 bbls. daily.

KANSAS

The second well in the Sedgwick Pool of Sedgwick County, Kansas, was flowing at the rate of 1,700 bbls. daily at last reports, and it had slightly more gas than the discovery well. The new well is Gypsy Oil Co., Marland Oil Co. and Bu-Vi-Bar Petroleum Co.'s No. 1 Lyon, and the corrected location is CWL NW SW, Section 7-26-1e.

According to estimates formed on the strength of wells now drilling in this region, the size of the structure upon which the two wells were found is larger than at first thought. Estimates regarding the number of good locations which will be drilled has been increased to 25.

GULF COAST

HOUSTON, Tex. Nov. 27.—Gulf Production Co.'s No. 2 Chambers, in the shallow sand pool of South Liberty, which came in Saturday making some gas and sulphur water, and which Monday started flowing 200 bbls. daily of pipe line oil, Tuesday was making only dry gas. This well is completed at a

(Continued on Page 162)

Cold Weather Curtails Panhandle Work

Ranger's Most Interesting Wildcat Proves Disappointing. Wichita Falls Production Again Over 100,000 Bbls.

By James H. Dameron
Fort Worth Bureau, The Oil and Gas Journal

FORT WORTH, Tex., Nov. 26.—Cold weather tightened its grip on the Panhandle for the first time this season with a resultant drop in production and curtailment of operations; the Ranger district's most interesting wildcat was a big disappointment and the Wichita Falls district remained the only bright spot in North Texas during the seven-day period.

Although there were no sensational wells completed in the latter district a group of producers kept production constant in most counties and sent a few up for gains sufficient to push Wichita Falls district production over the 100,000-bbl. mark again.

Activity in Archer County, particularly around Iowa Park and Electra, has been responsible for the small but steady gain in daily average of that county. Wilbarger registered a slight gain, as did Young County.

Young County's most promising wildcat, Panhandle Refining Co.'s No. 1 Morrison, Section 465, T.E.&L. Survey, 5 miles northwest of Graham, has been deepened without results. Last week it created excitement when it made 15 bbls. per hour and 3,000,000 feet of gas from lime at 4,283-96 feet. The well produced erratically for the past seven days, producing a total of 765 bbls. and went dead. Gauges from November 10 to November 15, both days inclusive, follows: 78 bbls., 104 bbls., 92 bbls., 117 bbls., 189 bbls., and 176 bbls.

Late last week the well was drilling in black lime at 4,363 feet. It is reported the owners plan to drill the well deeper and if production is not increased the hole will be plugged back and the 4,283-96-foot pay will be shot.

Haskell Pool Opener

Haskell County's first pool opener was completed last week and made 46 bbls. of oil and 10 bbls. of water when put on the pump. This well, Superior Oil Co.'s No. 1 Reynolds in the J. Fenner Survey, in the southeastern part of the county, was drilled by the Moody Corp. several weeks ago. It had pay at 1,728½-32 feet and started off making 60 bbls. of pipe line oil daily. Moody Corp. stock was purchased by the Superior company some weeks ago.

Most of the interest in the Ranger district was centered around J. D. Collett and associates' No. 1 Newell, Section 6, Block 11, T.&P. Survey in Shackelford County. The well is approximately 3 miles southwest of the Cook Ranch Pool. After finding 3,000,000 feet of gas in the Tannehill horizon it was a big disappointment when a hole full of water was found in the Cook horizon at 1,468-72 feet.

Production in the Ranger district was constant with the weekly daily average production estimates showing a decline of only 8 bbls. Shackelford and Callahan Counties made substantial gains but not sufficient to wipe out the natural decline of other counties.

Panhandle Decline

Panhandle had its first setback because of wintry weather this season with the result operations were slowed down and production likewise suffered. Hutchinson County suffered most, with a 2,000-bbl. drop in production.

Coupled with the cold weather the water situation in the Lefors area made inroads on Gray County's production. Moore and Carson Counties made slight gains and Potter County was up 15 bbls.

The water encroachment in the Lefors area is becoming more serious each week and the belief is growing that the water is bottom hole water. For a while it was reported most of the water was coming from the rotary drilling wells.

Five completions were reported from Panhandle, one being a 4,015-foot dry hole in Floyd County. Another was a 33,000,000-foot gas well in the Shamrock area of Wheeler County and the other three were oil wells in Gray County, the best of which was Midwest company's No. 2 Holmes, a 240-bbl. well in the Bowers Pool.

ESTIMATED DAILY AVERAGE PRODUCTION NORTH TEXAS
Week End'ng November 24, 1928

Panhandle District—	
Carson County	6,045
Gray County	25,525
Hutchinson County	28,150
Moore County	2,850
Potter County	30
Wheeler County	780
Total this week	63,380
Total last week	65,655
Decrease	2,275
Wichita Falls District—	
Archer County	19,277
Baylor County	87
Clay County	524
Cooke County	2,286
Jack County	1,285
Montague County	7,822
Throckmorton County	798
Wilbarger County	32,692
Young County	8,722
Wichita County	26,651
Total this week	100,144
Total last week	99,876
Increase	268
Ranger District—	
Brown County	10,305
Callahan County	3,805
Coleman County	3,873
Comanche County	1,245
Palo Pinto County	352
Ranger	5,859
Shackelford County	10,520
Stephens County	7,649
Total this week	43,608
Total last week	43,616
Decrease	8

PANHANDLE COMPLETIONS

Gray County

Magnolia Petroleum Co.'s No. 2 W. Harrah, 990 feet from north line and 330 feet from west line of NW cor. Section 150, Block 3, I.&G.N.R.R. Survey, swabbed 35 bbls. at 3,228-53 feet. Midwest Exploration Co.'s No. 2 Holmes, 330 feet from north and 357 feet from east lines SW, Section 86, Block 3, was drilled to a total depth of 3,265 feet and swabbed 240 bbls. at the granite wash encountered at 3,127-35 feet and 3,190-3,205 feet and 3,237-50 feet and 3,253-58 feet. White Eagle Oil Refining Co.'s No. 1 Shaw was shot with 265 quarts at 2,700-2,845-foot pay and flowed 35 bbls. daily. This well was drilled to a total depth of 2,860 feet.

Floyd County

Exploration Co.'s No. 1 Boone, in center of C. H. Johnson Survey, was dry and abandoned at 4,015 feet.

Wheeler County

Upham Gas Co.'s No. 1 Lamb, C N half NE SW, Section 91, Block 17, H.& G.N. Survey, was drilled to a total depth of 1,973 feet and made 33,000,000 feet of gas at 1,948-70 feet.

RANGER DISTRICT

Brown County

Bearman & Garrett's No. 1 Clark was dry and abandoned at 1,371 feet. Burris and others' No. 9 Newton was shot with 10 quarts at 1,200-20 feet and made 65 bbls. Forest Oil Co.'s No. 6 Moore made 60 bbls. at 1,250-72 feet. Humble Oil & Refining Co.'s No. 2-C Hickman was shot with 20 quarts at 1,233-43 feet and made 24 bbls. Keen's No. 1 Armstrong made 8 bbls. oil and 30 bbls. water at 1,430-40 feet. Oeininger and others' No. 1 Prather made 250,000 feet of gas at 1,575-1,600 feet. Their No. 1 Spivey was dry and abandoned at 1,050 feet. Kerr and others' No. 1 Hale was dry and abandoned at 470 feet. Lloyd and others' No. 11 Collier made 5 bbls. at 410-31 feet. The location was abandoned on their No. 12 Collier. United Royalty Co.'s No. 1-B Burns made 3,500,000 feet of gas at 1,124-30 feet.

Burnet County

F. C. Clark's No. 1 Warden was dry and abandoned at 940 feet.

Callahan County

Bradstreet and others' No. 1 Compere was shot with 30 quarts at 1,694-1,726 feet and made 12 bbls. Goodloe-Duffey & Moutray's No. 1 Hatchett was dry and abandoned at 475 feet. Reiter Foster Oil Co.'s No. 1 Hatchett made 5 bbls. at 364-69 feet. The Texas Company's No. 9 Hatchett made 60 bbls. at 345-56 feet.

Coleman County

Roth & Faurot's No. 1 Nixon made 2½ bbls. at 2,933-42 feet. Samuel's No. 1 Pitts was dry and abandoned at 3,503 feet. Independent Oil & Gas Co.'s No. 1 Overall was dry and abandoned at 2,176 feet. Reynolds & Unruth's No. 1 Gill was dry and abandoned at 1,012 feet.

Eastland County

Davis and others' No. 1 Butler was dry and abandoned at 1,558 feet.

McCulloch County

Haggerty and others' No. 1 Shelton was dry and abandoned at 1,010 feet. Lanning and others' No. 1 Barton was dry and abandoned at 1,015 feet. McLean & Jamieson's No. 1 Wells was dry and abandoned at 1,266 feet.

Palo Pinto County

Texas Pacific Coal & Oil Co.'s No. 1-B Robinson was dry and abandoned at 1,750 feet.

Shackelford County

Collett and others' No. 1 Taylor was dry and abandoned at 939 feet. Cranfill & Reynolds' No. 2 Flippen made 7 bbls. at 896-902 feet. Roeser & Pendleton, Inc.'s No. 83-A-60 Cook made 50 bbls. at 1,173-87 feet. Their No. 24-A-61 Cook made 75 bbls. at 1,357-79 feet. Their No. 25-A-61 Cook made 75 bbls. at 1,348-66 feet. Their No. 10-A-62 Cook made 5,000,000 feet of gas at 1,362-72 feet.

WICHITA FALLS DISTRICT

Archer County

Frank Hutcheson's No. 5 fee made 2 bbls. at 1,167-87 feet and was drilled to a total depth of 1,190 feet. Shappel Oil Co.'s No. 1 Turbeville was dry and abandoned at 1,870 feet. American Refining Properties and Corbett & White's No. 3 Cernosek made 63 bbls. at 1,414-32½ feet. L. T. Burns and others' No. 1 Abercrombie was dry and abandoned at 1,550 feet. C. W. Gilliland's No. 9 Neimeyer made 105 bbls. at 1,408-19 feet. Magnolia Petroleum Co.'s No. 12 Hudson made 16 bbls. at 1,160-68½ feet. W. H. Smith, Jr.'s No. 2 Prideaux was junked at 782½ feet. The Texas Company's No. 21 Richardson made 20 bbls. at 1,346-64 feet.

Cooke County

Pure Oil Co.'s No. 2 Embry made 52 bbls. oil and 65 bbls. water at 1,113-1,235 feet. Superior's No. 1 Reynolds made 46 bbls. oil and 10 bbls. water at 1,728½-32 feet.

Young County

Allday & Carter's No. 8 Johnson-A made 2 bbls. at 588-96 feet. Chancellor and others' No. 1 Oliver was dry and abandoned at 600 feet. Creath & Kell's No. 1 Brayan was dry and abandoned at 840 feet. Goldsmith and others' No. 1

(Continued on Page 161)

TEXAS PANHANDLE WILDCATS

For week ended November 24

Company, Well, Farm, Name, Section and Block—	Remarks—
CARSON COUNTY	
Denson et als' No. 1 W. E. Cobb, 930 ft. from N line, 280 ft. from E line, W ½ NW, Sec. 184, Blk. 2, I.&G.N. Sur.	S.D. 725 ft.
Duncan & Reiger's No. 1 J. B. Hodges, 330 ft. from E line and 330 ft. from S line of W½ of NW¼ Sec. 112, Blk. 7, I.&G.N. Sur.	Rig on ground.
Magnolia Pet. Co.'s No. 6 fee No. 244, 660 ft. from N line and 660 ft. from E line of E ½, Sec. 91, Blk. 4, I.&G.N.R.R. Sur.	Drlg. 740 ft.
Morris et als' No. 1 Barnard, NW cor. SW SE, Sec. 44.	Drlg. 450 ft.
Navajo Oil Co.'s No. 2 Poling, 660 ft. from W and 330 ft. from N lines, N 30 acres SW, Sec. 22, Blk. X-2, T.T.R.R. Sur.	S.D. 1,950 ft.
Reynolds et als' No. 1 E Cooper, 330 ft. from S line and 330 ft. from E line of NW, Sec. 5, Blk. 9, I.&G.N. R.R. Sur.	S.D. 260 ft.
Spartan Oil Co.'s No. 1 S. Bednorz, NW cor. E ½ NW, Sec. 202, Blk. 3, I.&G.N. Sur.	Drlg. 1,200 ft.
Skelly Oil Co.'s No. 10 Schafer, 1,320 ft. from W line and 330 ft. from S line of N½ Sec. 188, Blk. 3, I.&G.N.R.R. Sur.	Rig.
Stubblefield et als' No. 1 Cooper, 340 ft. N and 330 ft. W line SE, Sec. 5, Blk. 9	S.D. 1,060 ft.
Travis et als' No. 1 D. A. Harrell, C NE NE, Sec. 162, Blk. I.&N.G. Sur.	Fish. 2,410 ft.
Ware et als' No. 1 Ware, 990 ft. S and 400 ft. E of NW cor. Sec. 18, Blk. 3, A.B.&M.	Spud and S.D.
CASTRO COUNTY	
Colorado O. & R. Co.'s No. 1 M. Siemmons, SW cor. Sec. 73, Blk. M-17, B.S.&F. Sur.	Rig blown down.
Mystery Oil Co.'s No. 1 J. I. Crum, SE cor. NE, Sec. 333, Blk. M-6, S.R.&K. Sur.	S.D. 510 ft. for csg.
CHILDRESS COUNTY	
C. L. Sloane et als' No. 1 B. P. Smith, Sur. 49, F. P. Knott lands	S.D. 4,005 ft.
The Texas Co.'s No. 1 Smith, 100 ft. each way from NW cor. Sec. 174, Blk. H, W.&N.W. Sur.	S.D. 3,945 ft.
COCHRAN COUNTY	
Clark & Melat's No. 1 C. C. Slaughter, 1,650 ft. E and 660 ft. S of NW tract, League 118, Knox County School land	Rig blown down.
Marland Prod. Co.'s No. 1 C. C. Slaughter, 330 ft. from S and W lines, Carson County School land, Tr. 130	Fish. 1,550 ft.
COTTLE COUNTY	
Explts. Co.'s No. 1 Richards	C.O. 500 ft.
Explts. Co.'s No. 4 Matador Land & Cattle Co., C, Sec. 46, J. H. Stephens Sur.	Drlg. 2,245 ft.
Skelly Oil Co.'s No. 1 J. H. Cannon	H.F.W. 3,558 ft; S.D. 3,610 ft; (corrected depth).
Sun Oil Co.'s No. 1 T. B. Yarborough, 485 ft. S and 2,460 ft. E of NW cor. Sec. 551, Blk. H, W.&N.W. Sur.	Drlg. 3,200 ft.
GRAY COUNTY	
Adams Oil Co.'s No. 2 Morse, 330 ft. from E line and 990 ft. from S line, Sec. 3, Blk. 26, H.&G.N.R.R. Sur.	1,000 ft. oil; G.W. 2,457-60 ft.
B. S. Arnold's No. 1 J. E. Mingale, cen. east 160 acres, Sec. 212, Blk. B-2, H.&G.N. Sur.	S.D. 420 ft.
Arnold & Howell's No. 1 Turnex, C SW, Sec. 111, Blk. B-2	S.D. 2,224 ft. for pipe.
Biggs et als' No. 1 Morse, SW cor. Sec. 3, Blk. 26, H. &G.N Sur.	10,000,000 ft. gas 2,192-2,350 ft; C.O. 2,590 ft.
Camel Oil Co.'s No. 1 Harrah-B, 330 ft. each way from NW cor. NE, Sec. 150, Blk. 3, I.&G.N.R.R. Sur.	Cellar.
Crabtree Drlg. Co.'s No. 1 B. F. Talley, SW NE, Sec. 114, Blk. M-2, B.S.&F. Sur.	S.O. 2,400 ft; S.D. 2,735 ft.

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High Gravity Pool in Pecos County

Wildcat Testing 37 Degrees Estimated Good for 100 Bbls. of Virtually Sweet Crude With Only Slight Trace of Sulphur

By James H. Dameron
Fort Worth Bureau, The Oil and Gas Journal

FORT WORTH, Tex. Nov. 26—The long sought high gravity oil pool in the sulphur crude producing area of West Texas apparently was opened last week by a wildcat in Pecos County drilled by the Pecos Valley Oil Co. on its fee land in the C SW Section 22, Block 10, H.&G.N. Survey, northeast of Fort Stockton. In addition to this important development the week's news from the Permian Basin told of water showing in two other promising wildcats, another big deal in West Texas acreage and a 8,000-bbl. drop in daily average production.

Pecos Valley Co.'s No. 1 fee indicates the opening of the second pool in Pecos. The first was Yates many miles to the southeast. No. 1 fee is estimated good for 100 bbls. in sand and anhydrite at 1,626-28 feet. The oil is virtually sweet crude, having only a slight trace of sulphur and testing 37 gravity.

Nearest production is Shipley and associates' wildcat producer about 14 miles to the north which is making better than 100 bbls. daily from 2,480-81 feet. Like the Shipley well the Pecos Valley Co. well appears to be another east side well.

Elevation of No. 1 fee is 2,501 feet and it had not reached the top of the lime at 1,628 feet. The nearest dry hole is Cromwell & Kimberlin's No. 1 Scharff & Blackman, NW quarter Section 24, Block 3, abandoned at 2,126 feet in June, 1927. It is about 4 miles northeast of the new well. Approximately the same distance to the northwest Rowan & Tong's No. 1 Scharff & Blackman, Section 4, Block 9, was abandoned after getting sulphur water at 2,213-15 feet. The well had a show of oil and gas at 1,645-57 feet.

When the pay was encountered five or six bailers of sulphur water per hour was being carried from 500 to 600 feet. Six-inch casing is being run to shut off water and Sunday the well flowed 25 bbls. in 15 hours. Storage is also being built on the lease and the true worth of the find will probably be determined during the coming week.

No pipe lines run near the wildcat territory. Humble Pipe Line Co. is waiting for further developments in the Shipley well before announcing its decision on a proposed line south from Monohans to the Shipley well in Ward County.

As the excitement following the strike in this well abated two other promising wildcat tests were drilled into water. Alexander & Lyles and Eastland Oil Co.'s No. 1 Sellman, Section 20, Block Z, T.C.R.R. Survey, Pecos County, and about 2 miles south of the Yates Pool is shut down at 1,655 feet after encountering sulphur water at 1,652 feet.

For several weeks this well has been shut down at 1,626 feet where it was making 3,400,000 feet of gas and spraying a little oil, because it was not drilled on the intended location. It was to have been drilled in the SE quarter. Corrected location is 258 feet from the south line and 1,402 feet from the west line of the section.

Close on the heels of this disappointment Rector Oil Co.'s No. 1 Johnson, center Section 10, Block 32, southeastern Ward County and west of the Shipley wildcat producer, drilled into salt water sand at 2,135 feet. The hole was drilled to 2,168 feet and operations shut down with 1,100 feet of salt water in the hole. Eight-inch casing is being underreamed. The well had a show of oil farther up the hole.

Church-Fields Extension

Keck Investment Co.'s No. 1 McClintic, NE cor. Section 206, Block F, in Upton County, extended the Church and Fields Pool approximately a mile to the south. The well has 750 feet of oil in the hole from 2,890 to 2,932 feet and the last 100 feet rose in one hour. The well is to be shot and, based on the performance of other wells in the Church and Fields Pool that have been shot, this well appears to be a fair producer.

Henshaw Acreage Sold

Another big acreage trade with Roberts Pool acreage in Howard County forming the nucleus for the deal was made when Henshaw Oil Corp. of San Angelo sold its acreage in Howard, Brown, Winkler, Coke, Crockett and Ector County, Texas, and Blaine County, Oklahoma, to the American Maracaibo Co. The sale price is variously reported ranging from $2,500,000 to $3,000,000.

Henshaw Corp.'s No. 1 Settles A, Section 6, Block 32 T-2-S, west of the Roberts Pool in southern Howard County, was the key lease in the trade. The well is rated a 7,000-bbl. producer in the newly discovered 2,200-foot zone and upon completion of a pipe line connection the crude was to be sold at 80 cents per barrel, 15 cents above the posted price in the Roberts Pool which produces a lower gravity crude.

(Continued on Page 163)

Shipley, etal 100 Bbls. 2480-81'
Scale: 1 in. =4000 varas
WARD COUNTY
Michaelson, Talbot, Roxana
Cromwell & Kimberlin
Humble
Texas
Empire
Prairie
Pecos Valley Oil Co.
Trans Continental Oil Co.
Talbot & Dittmer
Atlantic
Cromwell

The record production of automobiles this year, with every indication that next year will break the existing record, promises a greatly increased demand for gasoline in 1929

To be prepared to meet this increased demand every refiner should install the Dubbs Cracking Process, crack low priced fuel oil by the non-residuum method and produce maximum yields of gasoline

Maximum profits will follow

Universal Oil Products Co
Chicago, Illinois

Dubbs Cracking Process
Owner and Licensor

Slight Decrease in Oklahoma Output

New Low Mark for Greater Seminole Area and Small Increase in St. Louis Pool. State Decline 2,305 Bbls.

By J. L. Dwyer
Staff Correspondent, Oklahoma Fields

Another slight decrease in the daily average production of the State, a new low mark for the Greater Seminole area, and a slight increase in the St. Louis Pool of Pottawatomie County were the chief field developments during the past week.

Oklahoma's daily average production for the past week was 712,970 bbls., a decline of 2,305 bbls. from the previous week's average. With a very limited number of good completions, the Greater Seminole production continued its steady decline, and on one day last week touched a new low of 283,650 bbls.

The future of Oklahoma production should not be difficult to predict for the remainder of the winter months. Within the next 10 days it seems destined to go below the 700,000-bbl. mark, and while much importance must necessarily be attached to the completion of the 73 wells now drilling in the Mission area, it should also be considered that by February 15, the official completion date for the Mission wells, the output of the remainder of the Greater Seminole area should have declined very close to 250,000 bbls. daily. It will therefore require about 50,000 bbls of the Mission area output to replace the decline which will have been experienced in the remainder of the Greater Seminole pools. It should also be mentioned that after Februray 15, the refineries will be increasing their daily crude runs in anticipation of spring gasoline demands.

Crude Price Outlook

The Oklahoma crude oil situation is far from normal for this time of year. During the past few years, the refining branches of the industry, feeling they were assured of a plentiful supply of crude, curtailed their runs with a consequent softening of the market. This fall, hovewer, they do not feel so sure of a plentiful supply of crude for next spring's requirements, and with gasoline stocks at a rather low point, they evidently have decided that the safest course for them to take is to continue to take the Oklahoma and Kansas light oils in order to insure their position next spring if a shortage of this grade of oil should actually develop. The price situation too has some effect upon the attitude of the refiners, and the majority feel that next spring will see a higher price prevailing for light oil, and therefore they prefer to take what crude they can at the current market price.

These factors have played an important part in giving additional strength to the crude oil situation in Oklahoma and Kansas at a time of year when normal seasonal requirements ordinarily result in a market which is rather soft.

Mission Air Lift Operation

The big rush of material to the Mission area now being over, the work in that region has settled down to the drilling of the wells which are to be completed February 15. One of the most important features of this drilling campaign is the foregone conclusion which the majority of the producers have reached that the Mission area will be a large air lift operation. This is best emphasized by the fact that the majority of leases within the borders of what is expected to furnish the bulk of Mission production are now being equipped with large air lift plants.

In the Maud area just west of the Mission region, there have been a few new locations announced, and much attention is being paid to two Wilcox sand test wells which near completion. They are both located to the north of the Wilcox sand discovery well drilled last year by the Barnsdall Oil Co., in the NE cor. NW, Section 14-8-5. The Empire Oil & Refining Co.'s No. 1 Cluck, NW cor. SE, Section 11-8-5, had the top of the Mayes at 3,702 feet, and is drilling in that formation at 3,740 feet. While the Mayes formation is rather indefinite, and is not generally used to establish calculations regarding the relative position of wells, it is very significant that, based upon the Mayes, the Empire well is running about 55 feet higher than the Barnsdall discovery well. The other interesting well in this region is the McMan Oil & Gas Co. and the White Eagle Oil & Refining Co.'s No. 1 Roberts, NE cor. SW SE, Section 9-8-5. This well is now trying to recement casing in the Woodford formation at 4,256 feet. It has a good show of oil and some water coming from behind the pipe. It is running rather low for the region, and its chances of production from the Wilcox are not viewed with any great amount of favor.

West Side of 8-5

On the west side of Township 8-5, the prospects for developing a big pool in the Hunton and Misener horizons received a jolt last week when the Prairie Oil & Gas Co.'s No. 1 Campbell, SE cor. SW, Section 18-8-5, had some oil and some water right in the top of the Misener sand. This well topped the Misener at 4,198 feet, and, contrary to the usual performance of Misener wells, failed to flow. It was then drilled 1 foot deeper, and began flowing oil and making some water. There is some question regarding the origin of the water, and for the present it is announced that the well will be drilled no deeper, at least until some of the other wells now drilling in this region reach the sand. The Prairie well is one-quarter mile west of the Pure Oil Co.'s No. 1 Lindley, which opened the Misener sand pool of this region.

Production by Pools

The production by pools of the Greater Seminole area on Monday morning, November 26, follows:

Pool—	Wells	bbls.
Pool—	Wells	Bbls.
Little River	303	104,388
Maud	8	5,279
Mission	12	1,522
Bowlegs	312	47,837
Earlsboro	288	77,053
Seminole	286	40,716
Searight	67	9,990
Total	1,276	286,785

On the east side of the Earlsboro Pool, the Magnolia Petroleum Co.'s No. 1 Gillan, NW cor. NE SW Section 13-9-5, has extended the pool for two locations. This well made 1,665 bbls. from Wilcox sand at 4,198-4,225 feet. On the northwest side of Earlsboro, the hopes of any extension for the limits of the pool were stemmed by the failure of The Texas Company's No. 6 Rogers, SE cor. NW SE Section 5-9-5. This well had the Wilcox sand at 4,377-94 feet with a good show of oil and a hole full of water. It will be plugged back to the Simpson sand where it should be good for 100 bbls. daily.

After two dry holes in the Wilcox horizon further eliminated the possibility of connecting the East Little River territory with the Little River Pool proper, the Magnolia Petroleum Co.'s No. 1 Sissy, SW cor. NW Section 33-8-7, is reported running rather high, and giving a possibility of extending the trend of production three-quarters of a mile to the northeast from the Mid-Continent Petroleum Corp.'s No. 1 Smith, NW cor. NE Section 5-7-7. The Magnolia well had the Viola lime at 4,202 feet, and the Simpson sand at 4,245-56 feet.

Northwest of the Maud area in Township 8-4, the Amerada Petroleum Corp. and Laurel Oil & Gas Co.'s No. 1 Hallum, NE cor. SE SE Section 1-8-4, has now increased its production after the back pressure was removed from the well. At the time the back pressure was lifted, the well was flowing 1,920 bbls. daily, and after the removal of the pressure, the increase started. The well made 3,665 bbls. on its best day's production, and there is a slight decrease in the amount of water which it was making. Originally the well was making 2 per cent water, and this amount has been reduced to 1 per cent.

St. Louis Pool

In the St. Louis Pool, the Pure Oil Co.'s No. 1 Thomas, SE cor. NE NE Section 26-7-4, was the best well to be completed last week. This well had the sand topped at 4,251 feet with the pay from 4,270-75 feet, and the first full day's flow showed 4,090 bbls. It is a direct west offset to The Texas Company and the Fuhrman Petroleum Co.'s No. 1 Cherry, which opened this part of the pool. The most important news from this sector is the fact that the Magnolia Petroleum Co.'s No. 1 Cherry A, NE cor. SE NE Section 26-7-4, a direct south offset to the Magnolia well, has gone to water,and is cutting 20 per cent. The Magnolia well had an initial output of 4,453 bbls. daily, and the latest report is that it swabbed and flowed 2,471 bbls., which was 20 per cent cut. The increase of water makes this part of the field look as if the Wilcox sand production would be restricted to a very small area, not over 150 acres, as the Magnolia well helps cut off the spread of production to the west. The Texas-Fuhrman well is the

WILDCAT OPERATIONS IN OKLAHOMA

NORTHERN OKLAHOMA

LATIMER COUNTY

Limestone Oil & Gas Co.'s No. 1 McMurray, SW cor. SW Sec. 15-5-18 ..... Shut down 2,800 ft.

GRANT COUNTY

Cowden and others' No. 2 Vollmer, CEL NE SW Sec. 22-25-4w ..... Shut down 5,640 ft.
Lario-Lathrop's No. 1 Cornell, NW cor. NW Sec. 24-28-3w ..... Rig.

HARPER COUNTY

Hoffer Oil Co.'s No. 1 Cooper, NW cor. SE SE Sec. 12-26-22w ..... Shut down 4,130 ft.

KAY COUNTY

Geo. L. Miller and others' No. 1 Home, NW cor. SE Sec. 11-24-3 ..... Dry and abandoned at 4,031 ft.
Lario Oil Co.'s No. 1 McKay, NW NE Sec. 14-29-1 ..... Drlg. 3,563 ft.
Tonkawa Development Co.'s No. 1 McDaniels, SE cor. SE Sec. 15-25-1w ..... Wilcox sand 4,915-4,926; dry and abandoned.

WOODWARD COUNTY

Otatot Development Co.'s No. 1 Simmons, SE cor. SE Sec. 32-24-17w ..... Shut down for pipe 1,490 ft.
Sharon Oil Co.'s No. 1 Elmore, SW cor. SW Sec. 25-21-21w ..... Rig blown down 3,025 ft.
Billy's Oil Co.'s No. 1 Watt, C SE Sec. 9-23-20w ..... Shut down 500 ft.
Burgoyne Brothers' No. 1 Merkins, SW cor. SE NE Sec. 15-21-19w ..... Underreaming 1,810 ft.
Farrond and others' No. 1 Johnson, SW cor. SW Sec. 1-23-17w ..... Underreaming 1,860 ft.

GARFIELD COUNTY

E. L. Love and others' No. 1 White, SE cor. NW Sec. 9-24-6w ..... Shut down 4,755 ft.
Marland and Barnsdall's No. 1 Looman, NE SE Sec. 9-20-4w ..... Shut down 5,735 ft.
Marland Oil Co.'s No. 1 Miller, SW cor. SW Sec. 12-20-4w. Shut down at 4,575 ft. waiting on test Sec. 9-20-4w.

NOBLE COUNTY

Alco Royalty Co.'s No. 1 Waltermire, SE cor. NW Sec. 33-21-1w ..... Drlg. 1,122 ft.
Marland Oil Co.'s No. 1 Kidd, NW cor. SW Sec. 32-20-1w ..... Shut down at 5,290 ft.; plugging back to show oil 1,836 ft.

KINGFISHER COUNTY

Galt-Brown Oil Co.'s No. 1 Wolff, NW SE Sec. 6-16-7w.. Completed contract 4,515 ft.; shut down.
McKinney & Crawford's No. 1 Sturgeon, NE cor. SW Sec. 27-16-6w ..... Drlg. 4,826 ft.

LOGAN COUNTY

Champlin Refining Co.'s No. 1 Clark, SE cor. SW Sec. 8-19-4w ..... Dry and abandoned 6,726 ft.
Margay Oil Co.'s No. 1 Cole, SE cor. SW NE Sec. 24-18-5w ..... Rig.
Haley & Smith's No. 1 Guler, SE cor. SW Sec. 33-18-3w. Shut down, 3,940 ft. corrected.
J. L. Donahoe's No. 2 fee, SW cor. NW SE Sec. 21-18-2w. Cleaning out 5,568 ft.

BLAINE COUNTY

Lowen and others' No. 1 Unknown, NW cor. SW NW Sec. 27-16-11w ..... Spudded and shut down; renewing leases.
W. J. Donnelly, trustee's, No. 1 Dickens, NE cor. SE Sec. 26-15-12w ..... Drlg. 4,240 ft.
Ragland and others' No. 1 Unknown, C NW SW Sec. 13-19-10w ..... Rig.

LINCOLN COUNTY

Phillips Pet. Co.'s No. 1 Stephens, SE cor. NW Sec. 29-12-3 ..... Location.
Morgan & Flynn's No. 1 Finlay, SW cor. SW Sec. 19-16-6 ..... Location.

McLAIN COUNTY

Empire Oil & Ref. Co.'s No. 1 Bonner, SE cor. NW NW Sec. 29-5-3 ..... Location.

MUSKOGEE COUNTY

Elk Drilling Co.'s No. 1 Jones, SW cor. SW Sec. 34-13-17 ..... Shut down 400 ft.
L. T. Haney's No. 1 Mitchell, SE cor. NW SE Sec. 33-13-18 ..... Shut down 2,290 ft.
J. L. Slusher's No. 1 Nave, NE cor. SW NW Sec. 20-15-20 ..... Shut down 732 ft.

HUGHES COUNTY

Bauer and others' No. 1 Penn, NW cor. SW NE Sec. 1-8-10 ..... Hole full water 4,025 ft.
Noble Oil & Gas Co.'s No. 1 Wicket, SE cor. SE Sec. 20-5-9 ..... Dry and abandoned 3,015 ft.
E. W. Whitney and others' No. 1 Moore, SE cor. SW Sec. 17-5-9 ..... Drlg. 2,468 ft.
Pure Oil Co.'s No. 1 Fixico, NE cor. SW Sec. 18-8-9 ..... Drlg. 4,272 ft.
Howard Petroleum Co.'s No. 1 Gilbert, NW cor. SE Sec. 25-8-10 ..... Underreaming 3,240 ft.
Gypsy Oil Co.'s No. 1 McGirt, NE cor. NW SW Sec. 21-6-8 ..... Sand 3,310-20 ft., corrected, hole full water.
T. B. Slick, Inc.'s, No. 1 Epperly, NW cor. NE NW Sec. 32-6-8 ..... Dry in Wilcox, 4,655 ft., plugging back.

(Continued on Page 116)

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best well in the pool, and is holding its output, making 4,500 bbls. daily.

Allen Pool Production

The production by companies and leases in the Allen Pool of Hughes-Pontotoc-Seminole Counties on Saturday, November 22, follows:

	Bbls.
Louisiana Oil Ref. Co.:	
Reed	564
Reed A	63
Puniuste	798
Statler	158
Perry	1,312
Warfle	231
McElroy	212
Harjo	548
Total	3,886
Homa-Okla Oil Co.:	
Adams	961
McCall	684
Milner	82
Milner B	22
Wheeler	7
Ritchie	161
Total	1,917
W. R. Ramsey:	
Webb	208
Harjo	25
Milner	654
M. Butler	38
Parker	98
W. Butler	5
Warfle	9
McElroy	45
Smith	20
Whitney	812
Total	1,914
Westheimer & Daube:	
Wade	1,698
Milner	240
Total	1,938
Barbara Oil Co.:	
Mount	30
C. B. Shaffer:	
Yoakum	398
Chapman	30
Total	428
Mid-Cont. Pet. Corp.:	
Fleet	1,642
Harjo	0
Total	1,642
Sun Ray Oil Co.:	
Cully	899
Nitchie	1,899
Amos	170
Barney	142
Total	3,110
Indian Terr. Ill. Oil Co.:	
Bingham	230
Osborn	702
Total	932
T. B. Slick, Inc.:	
Harris	20
Magnolia Pet. Co.:	
Reed	490
Anderson-Prichard:	
Cully	1,287
Sinclair Oil & Gas Co.:	
Nachochie	714
Peters	49
Amos	50
Total	813
Gilcrease Oil Co.:	
Punka	1,245
Reed	279
Reed (west)	24
Total	1,548
Gypsy Oil Co.:	
Peters	858
The Texas Company:	
Hyde	485
Lucy	1,993
Total	2,478
Burke-Greis Oil Co.:	
Nitchie	609
Grand total	23,897

Beckham County

Magnolia Petroleum Co. made location for No. 2 Gray, C SE SW, Section 14-9-23w. Co-Operative Syndicate's No. 1 Joyce, NE cor. Section 22-9-23w, is drilling at 200 feet. Magnolia Petroleum Co.'s No. 1 Ensley, C SW SE, Section 21-9-23w, has been completed for 8,250,000 feet of gas in lime at 2,325-2,750 feet.

Carter County

Shell Petroleum Corp.'s No. 3 Lyles, SE cor. SW NW, Section 11-2s-3w, was completed for 96 bbls. in sands at 2,817-3,273 feet.

Creek County

Houston Oil Co. made location for No. 3 Bullett, SW cor. NE NE, Section 20-

(Continued on Page 159)

SECOND PRODUCER COMPLETED IN SEDGWICK COUNTY POOL, KANSAS

By J. L. Dwyer
Staff Correspondent, Kansas Fields

The completion of the second well in the Sedgwick County Pool is the most important news of the week in Kansas. This new well is Gypsy Oil Co., Marland Production Co. and Bu-Vi-Bar Petroleum Corp.'s No. 1 Lyons, NW cor. SW Section 7-26-1e, and a diagonal offset to the discovery well. The Lyons well produced 863 bbls. the first 12 hours from the lime pay found at 3,352-56 feet. This is the same formation encountered by the discovery well; and it was at first thought to be the Wilcox sand. The prevailing geological opinion of this pay stratum now is that it is a lime at the top of the Ordovician series, and the greater part of the Mississippian section has been missing in wells drilled in this vicinity.

The good flow of the second well of the Sedgwick Pool unquestionably removes the thought that the first well was a freak as many had believed. The first well was the Gypsy, Marland, and Bu-Vi-Bar's No. 1 Wright, in the SE cor. NE Section 12-26-1w. The new well diagonally offsets the discovery well to the southeast. The discovery well is still flowing 1,400 barrels daily.

In the McPherson territory, Phillips Petroleum Co.'s No. 1 Stein, C SW Section 17-18-1w has 1,000 feet of oil in the hole and some water from sand found at 2,898-2,915 feet, and is shut down for tankage.

In Ellis County, the well which originated the recent interest is shut down waiting for a pipe line connection. It is the Phillips Petroleum Co.'s No. 1 Schultz, in Section 5-12-17w, and it is shut down with 3,000 feet of oil in the hole. This well swabbed 35 bbls. an hour on a swabbing test 10 days ago, and has been shut down since that time. The Sinclair Crude Oil Purchasing Co. will take the oil, and the Sinclair Pipe Line Co. is now laying a line from the well to the town of Toulon, 12 miles south on the Union Pacific Railroad. The oil will be loaded into tank cars at that point and shipped out by rail.

Continued bad weather kept the roads in an impassible condition a large part of the past week, but there are a few announcements of important wildcat wells. In Edwards County, the British American Oil Co. has announced that a wildcat well will be drilled in Section 31-25-17w; and the same concern will drill a test in Phillips County, in Section 34-2-19w.

Barber County

J. K. D. Shaffer's No. 2 Carter, C NE SE, Section 11-33-13w, has been completed for 40,000,000 feet of gas in sand at 4,528-56 feet.

Butler County

Blue Stem Oil Co. made location for No. 5 Doughty, C NW SW, Section 5-27-6. Empire Oil & Refining Co. is erecting the rig for No. 5 Sherrock, NE cor. SW, Section 27-27-5. The rig is also under construction for No. 4 Sherrock, NW cor. SE, Section 27-27-5.

Empire Oil & Refining Co.'s No. 6 Cranston, SW cor. SE, Section 22-27-5, was completed for 385 bbls. in sand at 2,720-51 feet. No. 2 Reetz, SE cor. NW SE, Section 34-27-5, made 75 bbls. from sand at 2,696-2,715 feet. No. 4 Cranston, NE cor. SW SE, Section 22-27-5, had sand at 2,726-76 feet and made 317 bbls. No. 1 Willets, NE cor. SE SW, Section 22-27-5, was completed for 15 bbls. in sand at 2,739-60 feet. Empire Oil & Re-

(Continued on Page 69)

FORDSVILLE AREA, OHIO COUNTY, PRODUCES 150 BBLS. IN SIX HOURS

By Whit
Staff Correspondent, Kentucky-Tennessee

OWENSBORO, Ky., Nov. 24. — No completions were reported from the eastern end of Kentucky or Tennessee, all new wells being in the western portion of Kentucky, and few were above the average, the largest being No. 6 on the Nancy Farmer lease, near Friendsville Chapel, in the Fordsville area of Ohio County, reported to have produced 150 bbls. in 6 hours, the largest producer yet found in that area. The finding of a dry hole on the Gossett lease, which was No. 7, was quite a surprise, as this lease is among the best in the Ohio County area, in the eastern edge of the Ambrose Pool.

Much transporting of materials into Daviess and Ohio Counties continues, every road having its heavily laden trucks, with trailers, following one another in close formation, seeking to forestall the coming bad weather. Once a little water falls on these roads in Ohio and Daviess County roads it is good night to everything but trouble. This is no criticism of anything but the natural soil found in the oil fields on the roads. There seems to be no bottom and but little effort is made to drain the roads. As soon as the fall rains begin a quagmire results, and horseback riding even becomes dangerous. One big operator, the Ellis outfit, has taken equipment to the amount of $40,000 into the Ohio County area in the past two weeks.

October Oil Runs

The four pipe line concerns making their reports in Kentucky show that they handled a total of 479,759.03 bbls. during October. Of this amount the Cumberland Pipe Line Co. handled 217,927.04 bbls. from the eastern Kentucky fields. This is an increase over the September runs of 24,583.58 bbls.

The Illinois Pipe Line Co. handled through its western Kentucky lines for October a total of 228,850.82 bbls., a gain over the September runs of 22,471.07 bbls.

The Paragon Development Co. ran through its lines for October, in Barren County, 21,182.76 bbls., and from Monroe, Cumberland and Clinton Counties 2,188.82 bbls., a total of 23,371.58 bbls., or 345.52 bbls. less than September runs. This company also handled 1,509 bbls. from the Clay County, Tennessee, Field for October, against 3,045.92 bbls. for September, or 1,536.92 bbls. less than September.

The Stoll Oil Refining Co.'s runs from Barren County, Kentucky, for October amounted to 9,609.59 bbls., or 366.33 bbls. more than for September.

The Producers Pipe Line Co., the James C. Ellis interests in the western Kentucky division, handles a large amount of crude through its lines, but does not make reports of its runs monthly.

Week's Work

A summary of the week's work in the Kentucky fields shows 27 completions, 16 producers with an initial production of 775 bbls., 10 dry holes and 1 gas well.

County—	Oil Comp.	Wells	Prod.	Dry	Gas
Ohio	13	9	493	4	0
Daviess	12	6	280	5	1
Allen	2	1	2	1	0
Total	27	16	775	10	1

Western Kentucky

Every drilling machine in the western part of Kentucky is in active operation and as long as the good weather prevails, work will be rushed. The best well reported for the Ohio County area, since last week, was Dr. M. F. Sirman's No. 6 on the Nancy Farmer farm, at Friendship Chapel, 3 miles north of Fordsville. It is reported to have pumped 150 bbls. in 6 hours, making it one of the largest yet found in the Fordsville district. Same

(Continued on Page 133)

KANSAS WILDCATS

BARBER COUNTY

Barbara Oil Co.'s No. 1 Blunk, C NE NW Sec. 20-34-13w..2,000,000 ft. gas 4,755 ft.
Rolland et al's No. 1 Pickens, NE cor. NW NE Sec. 27-20-14w ..... Drlg. 4,132 ft.
Skelly Oil Co. et al's No. 1 Winter, C E half Sec. 17-21-12w ..... Dry and abandoned 4,530 ft.

BARTON COUNTY

Everett & Wiley's No. 1 Ward, NW cor. SW Sec. 12-20-13w ..... Shut down 3,948 ft.
McJilton et al's No. 1 Evanston, SE cor. NW Sec. 34-17-11w ..... Rig.
Mid-West Exploration Co.'s No. 1 Karst, SW cor. SW Sec. 11-16-15w ..... Drlg. 2,320 ft.

BUTLER COUNTY

O. H. Fleming et al's No. 1 Brainard, NE cor. NW Sec. 22-24-3 ..... Drlg. 3,145 ft.
LaRobb et al's No. 1 Bronsenger, NE cor. SW Sec. 24-27-2 ..... Rig.
Swartz et al's No. 2 Randall, NW cor. NE NW Sec. 22-24-4 ..... Shut down 1,950 ft.

CHASE COUNTY

Griener & Fowler's No. 1 Carson, NE cor. NE Sec. 9-21-7 ..... Shut down 3,162 ft.

COWLEY COUNTY

Jones & Hall's No. 1 Shapland, NE cor. NW SE Sec. 20-30-6 ..... Drlg. 3,054 ft.
Roth & Faurot's No. 1 Ridding, SE cor. NW Sec. 31-32-6 ..... Drlg. 2,160 ft.
Roxana Pet. Corp.'s No. 1 Galley, NE cor. NW SW Sec. 18-35-3 ..... Drlg. 2,190 ft.
Pyle & Sutter's No. 1 Lindstrom, SW cor. NE Sec. 9-35-4 ..... Fishing 900 ft.
Prairie Oil & Gas Co.'s No. 1 Shane, SE cor. NW Sec. 12-33-3 ..... Dry and abandoned 3,775 ft.
Empire-Marland-Twin States' No. 1 Feaster, NW cor. NE Sec. 36-32-5 ..... Drlg. 1,710 ft.
E. B. Shawver's No. 1 Cook, NE cor. NE Sec. 20-30-6..... Drlg. 2,860 ft.
Crow & White's No. 1 Powers, C NW NE Sec. 9-32-5..... Sand 714-734 ft., 1,000,000 ft. gas
Slick & Martin's No. 1 Aspaugh, SW cor. NE Sec. 27-31-5 ..... Dry and abandoned 3,140 ft.
J. B. Markey's No. 1 Tatum, SE cor. SW Sec. 11-31-6..... Shut down 600 ft.
Jones & Hall's No. 1 Shapland, SE cor. NW SE Sec. 20-30-6 ..... Shut down 3,396 ft.

DICKINSON COUNTY

Empire G. & F. Co.'s No. 1 Duffy, NE cor. SW SE, Sec. 2-12-3 ..... Dry and abandoned 2,982 ft.

ELLIS COUNTY

Rush Oil Co.'s No. 1 Gatewood, NW cor. NW Sec. 4-15-20w ..... Shut down 1,100 ft.
Transcontinental Oil Co.'s No. 1 Boetcher, NW cor. SE SW Sec. 21-13-19w ..... Drlg. 3,145 ft.
Finney & Weiner's No. 1 Freeman, SE cor. SW Sec. 24-15-20w ..... Rig.
Labette Oil Co.'s No. 1 Urban, NE cor. NW NW Sec. 19-15-16w ..... Drlg. 2,150 ft.
James A. Brouk et al's No. 1 Gorham estate, C SE SE Sec. 35-15-16w ..... Running casing 2,044 ft.
Derby Oil Co.-Empire Oil & Ref. Co.'s No. 1 Krause NW cor. SW SW Sec. 17-14-19w ..... Shut down 3,100 ft.
Phillips Pet. Co.'s No. 1 Brull, C NW Sec. 34-14-17w .... Spudded.
Moncrief et al's No. 1 Johnson, SW cor. NE Sec. 9-13-19w ..... Rig.
John Brown's No. 1 Gestner, SE cor. SW NE Sec. 13-13-18w ..... Spudded and shut down.
Empire Oil & Ref. Co.'s No. 1 Wann, NE cor. NE Sec. 31-13-19w ..... Drlg. 2,720 ft.
Mid-West Exploration Co.'s No. 36 Furthmer, SE cor. SE Sec. 25-12-16w ..... Drlg. 825 ft.
Phillips Pet. Co.'s No. 1 Shultz, C NE Sec. 5-12-17w ..... Lime 3,573-75 ft., 2,000 ft. oil.
Mid-West Exp. Co.'s No. 1 Austin, NE cor. NE Sec. 36-12-16w ..... Casing trouble 3,060 ft.

(Continued on Page 69)

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Salt Water Not So Bad in Trinity Field

Interest Not Slackened in Magnolia Producer in Caddo Parish. Deep Tests in Haynesville and Homer Fields

By D. H. Bancroft
Staff Correspondent, Louisiana-Arkansas

SHREVEPORT, La., Nov. 26.—Appearance of salt water in Magnolia Petroleum Co.'s No. 3 Levee Board in Section 7-20-15, Caddo Parish, the first well in North Louisiana to find a true sand in the upper Trinity, is not as bad as it sounds and interest in the well has not slackened on that account. The well, which came in last Sunday flowing 50 bbls. an hour from 8 feet of sand, at the bottom of 17 feet of broken formation, total depth 3,012 feet, is on the southern edge of a square mile of territory which, surrounded by production from shallower sands, had proved barren in those older producing horizons and was practically condemned until the Magnolia, which owns the entire tract except for two small pieces in the hands of brokers, decided on a deep test. It started flowing by heads about 3 o'clock Sunday afternoon while cleaning itself and was estimated at 500 bbls. Opened Monday morning after being shut in all night it started flowing about 300 bbls. of fluid with a good gas pressure, the fluid testing 10 per cent water and 54 per cent b.s., the oil testing 32.3 gravity, corrected. Previous to coming in it had stood 1,000 feet in oil and 100 feet in water. Saturday its production increased to 300 bbls. salt water and 200 bbls. of oil with 2,000,000 feet of gas and 3-inch tubing is being set with packer. The company will drill three more wells on the same lease at once, it was stated.

Pine Island Deep Test

Dixie Oil Co.'s interesting deep test in Pine Island, No. 92 Dillon in Section 13-21-15, continues to make haste slowly in cleaning out the hole to set 4½-inch at 5,850 feet for a test of 5 feet of sandy lime at 6,099 feet to test a strong gas show. The company also is getting favorable results in drilling No. 1 Gilbert in Section 27-21-5, Claiborne Parish. The log shows the top of the anhydrite at 4,009 feet, about 180 feet higher than it was found in the only well drilled below the old producing sand in the Haynesville Field.

With Haynesville having a deep test in Smitherman & McDonald and others' No. 1 Miller in Section 14-23-8, which cemented 9¼-inch casing this week at 3,600 feet, Homer also is to have a similar test, 4,000 to 4,500 feet, Oakes and others having made location in the NE cor. SE, Section 19-21-7, where they have derrick up for No. 1 Richardson. Smackover also is to share in the growing campaign for deeper drilling, Simms Oil Co. having rigged up again on No. 11 Hildebrandt in Section 33-15-15, to make more hole. It was completed June 4, 1926, gauging 42,600,000 feet of gas from 2,717 feet. J. E. Crosbie has set 6⅝-inch casing at 2,014 feet on No. 2 Primm in Section 23-15-16, and has location 480 feet west and 300 feet south NE cor. SW SW, Section 24-15-16 for No. 3. These, however, are apparently not to be deep holes.

In the Champagnolle district, C. E. Murdock is arranging to deepen No. 1 Gregory in Section 10-17-14, which he completed last December pumping 50 bbls. of oil and 450 bbls. of salt water from the shallow sand at 2,765 feet and will drill it to the 3,000-3,200-foot level. Lion Oil Co. has the makings of a good well in No. 3 Nash in Section 6-17-13, which flowed through drill stem at the rate of 1,000 bbls. of clean oil, total depth 3,062 feet. No. 2 Rowland in Section 15-17-14, which has been standing 1,000 feet in fluid from 15 feet of sand at 3,297 feet is perforating casing from 2,970-80 feet for shallow sand production.

Southeastern Arkansas

Failure to get production in either of the half dozen wildcats that have been drilled in southeastern Arkansas during the past few months has not had any appreciable effect on the activity in that part of the country. On the other hand, reports reaching here say, geophysical work, blocking and plans for drilling are going on about as they did early in the summer when the play began. A number of Oklahoma companies and operators have come in and are checking previous surveys and taking acreage. It is understood Tidal Oil Co. will give this locality first choice in its expenditure for 1929 wildcatting and The Texas Company which has already drilled two wells in Ashley and Chicot Counties will drill a third in Township 18, Range 4, Ashley County, 5 miles south of the Gay well and 9 miles west of the Hammond in Chicot County. Ohio Oil Co., in addition to its large blocks in Bradley and other counties, has leased 92,000 acres of the Jerome Lumber Co. lands in Drew, Desha and Chicot Counties and plans two wells.

Good Week in Champagnolle

It was a good week for Champagnolle, three completions adding 1,689 bbls. new production and the fourth 35,000,000 feet of gas. The first salt water well in the eastern extension was also completed this week, J. W. Olvey abandoning No. 1 Sample in Section 7-17-13, at 3,257 feet. And here again comes in one of Champagnolle's anomalies. Olvey's well is a south offset to Marine Oil Co.'s No. 3 Sample, a 600-bbl. producer from 3,065 feet last week, and an equal distance north of E. M. Jones' No. 1 Sample completed this week as the gasser mentioned, at 3,196 feet. Olvey's well was dry at 3,058-64 feet and made a small show of oil and gas at 3,217-21 feet. Jones' well is blowing from 10 feet of sand and is the farthest south well in the extension.

Lion Oil Refining Co. completed No. 4 Union Sawmill in Section 7-17-13, flowing 78 bbls. from 17 feet of broken sand, total depth 3,096 feet, and Ohio Oil Co.'s No. 2 Nash Acct. 1, in Section 6-17-13, started off with 144 bbls. for the first 17 hours, or 211 bbls. per day from 7 feet of sand, total depth 3,027 feet. No. 1 Nash, Acct. 2, in the same section, is reported a completion at 3,022 feet flowing at the rate of 1,400 bbls. per day. The only Louisiana proven area completions were in Webster and Ouachita Parish gas districts. Jordan Drilling Co.'s No. 1 Cole in Section 1-18-3, Ouachita, gauged 15,000,000 feet, total depth, and Magnolia Petroleum Co.'s No. 1 Lewis, in Section 25-23-10, Shongaloo district of Webster, was dry at 3,223 feet. It was a second completion, having been deepened from 2,757 feet. No. 1 Bond in Section 5-22-9, tested 500,000 feet of gas at 2,619 feet and is shut down for orders, and will probably make a little more footage as it is in the locality where considerable oil showing in two other wells, one of which made a small pumper, created something of a stir a couple of months ago. There was one completion in East Texas, Nick Barbare's No. 4-A-1 Furrh in the James Short Survey, gauging 1,000,000 feet of gas, total depth 2,370 feet.

Production Decline

Production from the division declined again this week, losing 905 bbls. in a total pipe line run of 121,230 bbls. Louisiana pools dropped off 580 bbls. and Arkansas 225 bbls. Champagnolle with 120 bbls. and Caddo heavy with 50 bbls. were the only runs showing an increase. Champagnolle now has 100 wells on production, averaging 130 bbls. Cotton Valley, light oil, which is down to 510 bbls., is all from two wells, Ohio Oil Co.'s No. 38 Bodcaw, the discovery well in Section 15-21-10, which is making 10 bbls., and No. 39, in the same lease and section which is making 500 bbls. Daily average runs from the field were:

Louisiana

	Bbls.
Caddo, light	9,150
Caddo, heavy	2,980
Homer	4,075
Haynesville	5,800
DeSoto-Red River	4,050
Elm Grove	595
Bellevue	900
Cotton Valley, light	510
Cotton Valley, heavy	3,400
Urania	6,200
Pleasant Hill	515
Total	38,175

Arkansas

El Dorado	4,950
Smackover, light	7,150
Smackover, heavy	53,765
Stephens	1,010
Nevada County	1,320
Lisbon	1,710
Champagnolle	13,050
Bradley	100
Total	83,055
Both states	121,230
Last week	122,135
Decrease	905

NORTH LOUISIANA

Bossier Parish

Elm Grove and Sligo—Barrett & Morgan claim a gas show at 2,150 feet in No. 1 Jones, Section 16-17-11, and are arranging for a drill stem test at 2,150 feet. Palmer Corp. is drilling chalk at 1,078 feet on No. 11-B Hodges, Section 25-16-12.

Caddo Parish

Mooringsport—Falcon Drilling Co. set 82 feet of 10-inch surface casing and is drilling at 350 feet on No. 3 Muslow, Section 29-20-15.

Oil City—Magnolia Petroleum Co.'s No. 3 Levee Board, Section 7-20-15, is flowing 300 bbls. fluid, 30 per cent b.s. and water from 8 feet of sand and is arranging to set 3-inch tubing, total depth 3,012 feet. H. M. Mattson tested No. 1 Boisseau, Section 34-21-16, at 2,290 feet and is waiting on standard rig to pump.

Pine Island—Dixie Oil Co. is cleaning out No. 92 Dillon, Section 13-21-15, at 5,850 feet, total depth 6,099 feet. Magnolia Petroleum Co.'s No. 18 Robertshaw, Section 24-21-15, is drilling lime at 3,411 feet; No. 23 Robertshaw in Section 23-21-15, cemented 8¼-inch at 2,725 feet.

Monroe District

Morehouse Parish—Natural Gas Producing Co. set 12-inch surface casing at 174 feet on No. 13 Tensas, Section 34-22-4, total depth 190 feet. Southern Carbon Co.'s No. 7 Tensas, Section 15-22-4, is drilling at 1,745 feet. Stovall Drilling Co.'s No. 1 Etheridge, Section 22-20-4,

(Continued on Page 70)

SHELBY COUNTY WELL NOW 80 BBLS.; PRODUCING FROM FORT WORTH LIME

By D. H. Bancroft

SHREVEPORT, La., Nov. 26.—Coming in a week ago as the first real well in Shelby County, Texas, in 10 years of prospecting, Gulf Refining Co.'s No. 1 Pickering in the P. W. Harvey Survey, 10 miles southwest of Logansport, La., has been the headliner in wildcat activities ever since. It was formally listed on the week's completions report as a 145-bbl. producer from 3 feet of sandy lime, total depth 3,383 feet. But the 24-hour gauge after this listing gave it only 80 bbls. While this is about twice, and in most cases more than twice, the average production of the short-lived producers Shelby County has produced in the past, the slump has aroused fears in some quarters that even this stellar performer may relapse into another chapter of the "Shelby shows."

Nevertheless, there is a great deal of royalty trading as the result of its showing and some activity in leases. All the area immediately around the well is owned by the Gulf and the Magnolia Petroleum Co., consequently there is little close in acreage to be had. Production is from the upper series of the Fort Worth lime, the same formation, according to some authorities, from which the recent blow-outs of large quantities of gas in Panola County wells to the north, these showings coming from a level considerably lower than commercial production of any sort has been obtained in the past. It is understood that the Gulf company will proceed to drill another well on the Pickering in the near future, developing that property rather than making a second attempt at this time to find production on the Blanchard block in Caddo Parish on which its first test was completed last week as a dry hole at 4,564 feet.

Calhoun County Abandonment

Abandonment by Amerada Petroleum Corp. of No. 1 Matlock in Section 10-12-13, Calhoun County, Arkansas, as a dry hole was the only other development of particular attention coming up during the week. Abandonment was at 3,754 feet. There is no record on log of igneous rock Arkansas Natural Gas Co. got in No. 1 Tate, Section 4-9-11, Cleveland County, nor The Texas Company's wells in Ashley County at 3,187 and 3,496 feet. These three wells, however, are several miles removed north and southeast from the Amerada test which topped the red beds at 3,107 feet, tested 4 feet of sand at 3,284 feet and was still in the red beds when abandoned. It is the sixth of the present series of deep tests for red beds production in southern Arkansas to miss getting it, but there are as many more still under way.

Two wildcat completions in Louisiana territory were divided between a small producer in the Oakland district of Union Parish and a dry hole in the southern tip of the same parish. Carter & Wingfield's No. 2-A Clark in Section 7-23-1e, started pumping 20 bbls. of fluid, half of it 35 gravity oil and half salt water from 10 feet of sand, total depth 2,295 feet. This is about the proportions obtained in wells drilled during the discovery era of this district in 1924 but below the average of Carter & Wingfield's more recent completions. The southern Union Parish well was a wildcat in Section 13-19-1e, drilled by Woodley and Fox on the McLeod land to contract depth of 3,000 feet without getting a show of anything warranting a test.

W. P. Wallace and others, among whom is Jack Stanford who was active in this division during the Homer boom, have made a location in Section 15-16-10, for No. 1 Ashley on Lake Bisteneau in Bienville Parish. This territory, like that around Arcadia, has been much prospected with the difference that the Lake Bisteneau area has yielded much more positive results than either of the domes

(Continued on Page 141)

Bruner Field Liveliest in Southwest

Over 50 Derricks in Caldwell County District. Water Wells Where Oil Was Expected and Formations Problematical

By B. D. Stevenson
Staff Correspondent, Southwest Texas Fields

SAN ANTONIO, Tex., Nov. 26.—There are over 50 derricks at this time in the Joe Bruner Field in Caldwell County which is the newest and liveliest area of development in Southwest Texas but the past week in that field was a checkered proposition getting water wells where according to expectations they should have been oil wells, with formations low where they were expected to be high and high where they were expected to be low. Sun Oil Co.'s No. 2 Malone reported last week with the top of the Edwards lime low is a sulphur water well showing very little oil. It is 300 feet northwest of Sun Oil Co.'s No. 1 Malone, the discovery Edwards lime well of the field. Lutex Oil, Inc.'s No. 3 Davis, an offset, is also a sulphur water well. Golden West Oil Co.'s No. 4 Wilson, one location southeast and one location southwest of Sun Oil Co.'s No. 1 Malone, is one of the best wells in the field. It got the Edwards lime at 2,691 feet and 6 feet in the pay is flowing oil before casing is set.

The Joe Bruner Field has been worked as a faulted area with the fault line taking the northeast and southwest trend of fault lines usually in the Balcones fault zone. The tip of formations in all this area is to the southeast and normally wells to the southeast would hit the formations a little lower than those to the northwest. However, Golden West's No. 4 Wilson got the Edwards higher and its No. 1 Cook got the chalk at 2,250, the highest in the field and it is still farther to the southeast. Possibly the drag theory may come in and explain it.

One Pay Only

The rule of the oil and gas division that two separate pay formations cannot be taken in the same well is having some influence on the field. Some of the first wells were completed to take in both the Austin chalk and the Edwards. Drilling to the Edwards entailed but little additional expense. Now with a fairly good well in the Austin which must be cased off if the well is drilled to the Edwards lime an operator hesitates and Carl Brothers and Suttle and Ratcliff and others, each with wells on the Cora Malone and the farthest south in the field, have not drilled to the Edwards. They are making oil in the Austin chalk. It would satisfy the curiosity of a lot of folks if they drilled to the Edwards.

One of the features the past week is the North & South company's No. 1 Baker at the south end of the field which got the chalk at 2,535 feet a couple of hundred feet too low. It condemns a lot of territory and practically guarantees that the field is not going to extend down through the townsite of Luling. A lot of town lots were leased up by civilians at rather fancy prices. Also the Lutex Oil, Inc.'s No. 4 Davis is a water well—too far to the west and it is very discouraging to nearby wells. The Lutex Oil, Inc. got the top of the chalk at 2,302 feet which is quite high but the top of the Edwards is at 2,765 feet which is quite low. Turman & Brown, just west of it about 450 feet, have the top of the chalk high and Cranfill & Reynolds' No. 1 Merriweather got the top of the chalk at 2,291 feet which is very high. It is a direct offset to the Lutex Oil, Inc.'s No. 4 Davis. The field is in rather a perplexing condition with one not knowing hardly what to expect.

Best Well in Field

Abercrombie's No. 1 Lida Moses came in flowing at the rate of 1,100 bbls. the first 24 hours and is probably the best well in the field. It got the top of the Edwards at 2,713 feet or within a foot of where the Sun Oil Co.'s No. 1 Malone, the discovery Edwards lime well, got it. It is 3,200 feet northeast of the Sun well and it at once calls for an offset by the Gulf. Several locations were made the past week in the northeast end due to necessity for offsets.

Humble company has made a location and is rigging up on the T. B. Johnson farm in the James Hinds Survey, 3 miles northeast of the Sun Oil Co.'s discovery Edwards lime survey. It is an important test. T. C. Hadley's No. 2 Wilson, a dry hole, is to the west of the line from the Humble location to the Sun well and the three wells on the Carter lease, all dry, drilled by the Luling Oil & Gas Co., are to the east of the line. Humble may pick up the line of production and greatly extend the field. There are no dry holes to prove that it cannot.

Refugio Field

Several wells were due to come in or prove disappointments in the Refugio Field as the week closed. Houston Oil Co.'s No. 9 Rooke is in the 3,700-foot sand and set casing; No. 10 is setting casing to test the 3,152-foot sand reported last week and No. 11 tested salt water at 3,515 feet and will continue to the 3,700-foot sand. W. L. Pearson's No. 1 Mitchell, the farthest north of any well drilling, passed the 3,700-foot horizon without production and at about 3,900 feet is in another sand that will be tested. It may be gas or water. It will be a drill stem test.

There were two important sales, Saxet Gas Co. bought the Texas Gas Co.'s No. 2 Holmes Heard, the discovery oil well in the north end of the field and the 40 acres it is on. The consideration is said to be around $85,000 and an overriding royalty. Union Exploration Co. (William F. Morgan) bought the lease on four 40-acre tracts out of the Holmes Heard farm north of that for around $100,000, half to be cash and half from production, when, if and as produced.

Another feature of the field is Magnolia Petroleum Co. moving in a rig from Luling to drill a well, practically wildcat, 2 miles north of the field on the Goliad road on Claude Heard land.

Laredo District

In the Laredo territory there were several completions but none of especial importance. Rycade Oil Corp. has set casing on its No. 4 Yeager-Strohman at the south end of the Albercas Pool, one location south of the nearest production.

In the Schoolfield-O'Byrne Pool in northwestern Duval County, The Texas Company got a 250-bbl. oil well in No. 1 Hahl, a southeast offset to the discovery well and in sand at 2,345-49 feet, the average depth. S. & O. Oil Co. got 10,000,000 feet of gas with 800 pounds rock pressure in No. 1 Bowe in sand at 2,324-31 feet, 2,000 feet southwest of the discovery well and right in the direction the oil production was supposed to be. It is too early to say what it indicates. The Texas Company's No. 1 Hahl flowing 250 bbls. and the Sun Oil Co.'s No. 1 Henne-Winch flowing 216 bbls. of oil a day are each bigger than the discovery well and are east and southeast offsets to it. The Onyx' No. 2 North, a west offset, is a 98-bbl. well and the S. & O. Oil Co.'s No. 1 Bowe, 2,000 feet south and 1,000 feet west is a gas well, which seems to make the territory on the east side of the few wells that have been drilled thus far look the best. The Magnolia company's No. 1-B Hahl, 1,200 feet due north of the discovery well, is a 35-bbl. well.

COMPLETIONS

Caldwell County

Lutex Oil, Inc.'s No. 4 Wilson, A. Floyd Survey, Joe Bruner Field, has been completed at 2,774 feet swabbing oil and sulphur water and is only a small well.

Abercrombie & Co.'s No. 1 Lida Moses, A. Floyd Survey, Joe Bruner Field, completed at 2,732 feet flowed 1,100 bbls. first 24 hours.

M. K. Towns' No. 1 W. W. Hickman, Gerren Hinds Survey, Joe Bruner Field, has been completed at 2,716 feet flowing about 400 bbls. of oil through 6⅝-inch casing, and tubing will be set.

Carl Brothers-J. S. Suttle's No. 1 O. W. Malone, A. Floyd Survey, Joe Bruner Field, completed at 2,694 feet is swabbing about 25 bbls. from Austin chalk and Buda.

Magnolia Petroleum Co.'s No. 13 W. J. Tiller, John Henry Survey, Luling Field, has been completed at 2,148 feet an average well.

Magnolia Petroleum Co.'s No. 8 W. Branyon, Nancy Reaville Survey, Luling Field, has also been completed at 2,168 feet an average well for the field.

Duval County

Onyx Oil Co.'s No. 2 Norton, Survey 250, Block 19, Schoolfield-O'Byrne Field, completed at 2,341 feet is making 98 bbls.

S. & O. Oil Co.'s No. 1 Bowe, Survey 250, Block 21, also Schoolfield & O'Byrne Field, has been completed at 2,345 feet making 10,000,000 feet of gas with 800 pounds rock pressure.

Jim Hogg County

Randado Oil Co.'s (American Well & Prospecting Co.) No. 25 Palacious, Survey 291, has been completed at 1,275 feet making 325 bbls.

Jackson County

Wright Brothers' No. 7-A Drushel, T. Rodriguez, completed at 3,200 feet is making 15,000,000 feet daily.

Nueces County

Agua Dulce Oil & Gas Co.'s No. 1 John O. Sponberg, George H. Paul Subdivision, Section 87, Agua Dulce Field, completed at 2,029 feet is good gas well.

Webb County

Magnolia Petroleum Co.'s No. 2 Valdez, Survey 754, Block 16, Magnolia-Cole Field, completed at 2,340 feet is making 200 bbls.

Aviator Gas Co.'s No. 1 E. Garcia, Survey 606, Block 11, Mid-Ojuelos Field, completed at 1,610 feet is making 10 bbls.

Zapata County

South Texas Production Co.'s No. 1 Jennings, Cerrito Blanco grant, Jennings Field, completed at 1,436 feet is making 30,000,000 feet daily.

ABANDONED TESTS

Atascosa County

Witherspoon Oil Co.'s No. 4 Lucy Nichols, Gray Survey No. 516, Somerset Field, at 2,167 feet is dry and abandoned.

Bastrop County

Col. Billy Mayfield's No. 1 McColl, Stephen F. Austin Survey, 450 feet south of river and 750 feet to east line of farm, at 592 feet has lost hole and abandoned test.

Webb County

O. W. Killam's No. 5 Billings, wildcat in Survey 713, is dry and abandoned at 2,500 feet.

R. C. Holsworth's No. 1 Wheatley,

(Continued on Page 133)

SHOWING OF OIL IN BLANCO COUNTY; FIRST WELL DRILLED IN THAT AREA

By B. D. Stevenson

SAN ANTONIO, Tex., Nov. 26.—Robert Rodson has a showing of oil in his No. 1 Glasscock in Blanco County, the first well ever drilled for oil in that county that anyone has any recollection of and the first to "hit" oil. Total depth is 1,049 feet and it got several barrels out by bailing and the oil on the cable showed about 60 feet of oil in the hole. The well is about 45 miles due north of San Antonio. There is about 500 feet of open hole and 6⅝-inch casing is set but not cemented above that. The proposition now is to pull the casing, ream the hole down and set again and try to make a well. Blanco County is pretty rough and badly broken up and oil operators have pretty generally let the county alone on the theory that it was too badly broken up to produce oil. Leslie N. Shaw made the location for Rodson's No. 1 Glasscock and an examination of the county and the territory convinced him there was a chance for the same formations producing in North Texas on the north side of the Llano uplift to produce in Blanco County on the south side of the Llano uplift. The crests of the hills in that territory are Edwards lime and the streams have cut through to as deep as the Glenrose and according to Shaw's report the best chance for production at the Rodson location was estimated to be at about 1,800 feet.

Laredo District

Attempts to find some oil in the area around the old Reiser gas field in Webb County got a little setback when R. C. Holsworth temporarily abandoned his No. 1 Wheatley in Block 3, Survey 1,569, at 1,481 feet but the Marts-Beaven's No. 1 Johnson at about 2,700 feet is within 50 feet of the estimated depth to a sand that ought to pay off. This well has had a little to encourage it since it has had several sands and some little showings of oil.

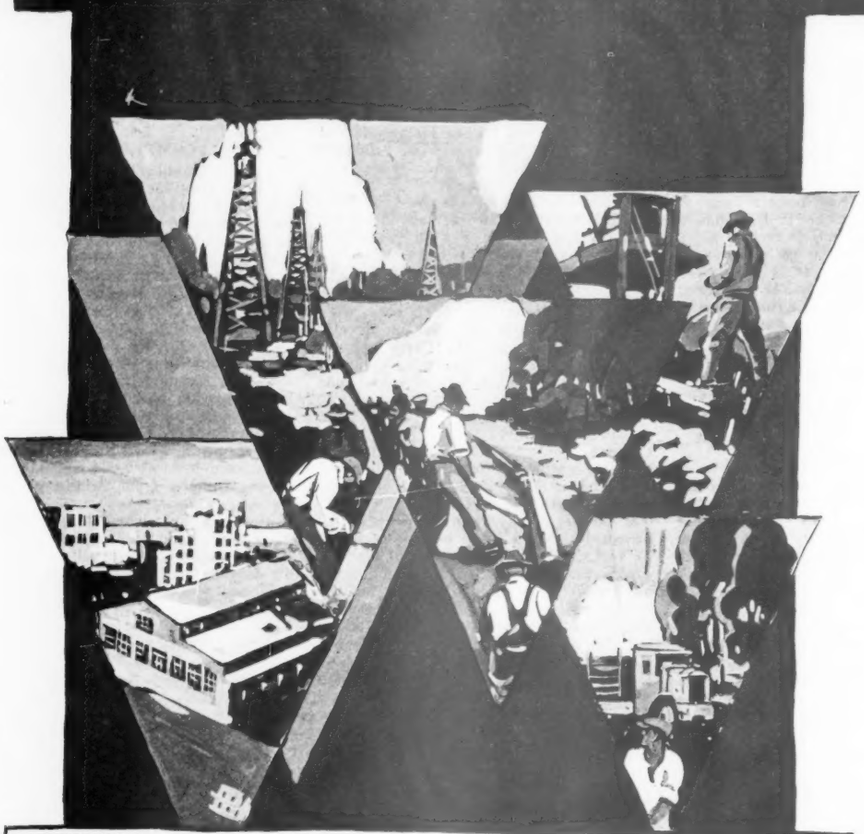
Wildcatting in the Laredo territory is sticking pretty close to areas where wildcatting has been done before and where showings of oil or gas and well logs have indicated a probability of a structure. National Oil Co.'s No. 1 Adams is an exception. It is in northern Zapata County and far to the west of anything drilled in that section. It is about the only exception to the rule. R. V. Hill who almost got a well south of the Alworth Pool in Jim Hogg County is starting another hole. A bad cement job lost No. 3 Ramirez when it had enough oil in the hole to make it look like it would open a pool. No. 4 is rigging up. Depth to the sand is only about 1,000 feet and it will be in the pay inside of a week. If he gets a well it will extend the chain of pools with the Albercas Pool on the north, Henne-Winch-Fariss next south, Alworth south of that and Hill's Pool south of that.

Suladie-Mims are in a sand at 1,854-59 feet in their No. 1 Puig on the Kirkpatrick 160-acre tract, a little east of the Aviator Pool, and in an area where two or three wells have got a little oil at about that depth but failed to make commercial wells. Suladie-Mims have set casing.

O. W. Killam has abandoned his No. 5 Billings in Survey 712 of Webb County at 2,500 feet. This is in a spot along the Reynosa Escarpment where a number of tests have been drilled.

(Continued on Page 134)

FROM WELL TO METER



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South Liberty Still Most Active Area

Three More Wells Completed in Shallow Sand District of Coastal Pool. Two New Producers at Pierce Junction

By Neil Williams
Staff Correspondent, Gulf Coast Fields

HOUSTON, Tex., Nov. 26.—Except for the completion of three more wells in new shallow sand area of South Liberty, two good wells at Pierce Junction and the continued active leasing program going on there were no developments of particular interest in the Gulf Coast the past week. There was a sharp drop in the number of completions, most of these being small routine wells or abandonments and daily average production for the coast as a whole was steady.

The shallow sand pool of South Liberty still is the most active spot on the coast. Early in the week the Sun Oil Co. completed two more wells. This company's No. 12 Mitchell, 100 feet east of the discovery well, No. 10, came in flowing an estimated 1,000 bbls. daily from sand at 1,031 feet, 83 feet of screen being set on bottom. The same company's No. 13 Mitchell, 100 feet north of the discovery well, also made a 1,000-bbl. producer at 873 feet.

Offsetting the discovery well on the south, The Texas Company's No. 13 Staiti was not so successful, making only 250 bbls. daily from sand at 885 feet. This well was cased with 6⅝-inch pipe and would not flow until 2½-inch tubing was run in the hole. Similar trouble apparently is being experienced in this company's No. 14 Staiti, 100 feet east of the No. 13, which was bailed in late Friday but made only two small heads. Tubing also is being run in this hole.

Well Stops Flowing

South Liberty received a slight setback the middle of the week when Sun Oil Co.'s No. 10 Mitchell, the discovery well stopped flowing due to lack of gas pressure. However, Friday this well had been put on the pump and was making around 200 to 300 bbls. daily. This well came in for 1,250 bbls. daily the first of the month, then increased to 1,600 bbls., dropping then to 1,300 bbls. daily.

Five producers have been completed in this shallow sand so far, these being Sun Oil Co.'s Nos. 10, 12 and 13 Mitchell; Gulf Production Co.'s No. 1 Chambers and The Texas Company's No. 13 Staiti. Gulf Production Co.'s No. 2 Chambers, 100 feet north of No. 1 and a west offset to Sun's No. 13 Mitchell, was bailed in Saturday but unofficial reports from the field indicated it was making only sulphur water with the gas. No. 3 Chambers, 100 feet further north is reported to have tried to blow out. Gulf's Nos. 4 and 5 are nearing the sand and a location has been made for No. 6. Sun has two more wells on the sand, Nos. 15 and 16.

Of some interest now at South Liberty is Sun Oil Co.'s No. 11 Mitchell, an offset to Liberty Petroleum Co.'s No. 1 Turner approximately 2,500 feet north of the shallow pool. No. 1 Turner was completed during October making an estimated 200 bbls. daily, although for a time it blew wild making an estimated 1,000 bbls. daily. The Sun well Saturday was waiting casing cement to set to test sand at a total depth of 1,494 feet.

At South Liberty in the flank sand area, Sun Oil Co.'s No. 9 Mitchell was completed flowing 166 bbls., 10 per cent sediment and water. Blakely & Mean's No. 1 Blakely, Blue Ridge, an old well worked over, flowed 100 bbls. daily. Sinclair Oil & Gas Co.'s No. 4 Taylor and Atlantic, Boling, an old well deepened 3 feet to 2,945 feet, was put on the pump for 30 bbls. pipe line oil daily. At Vinton, Gulf Refining Co.'s No. 47 Star-Vincent was put on the pump for 100 bbls. of fluid, 30 per cent sediment and water.

Despite substantial increases at East Hackberry, Cameron Parish, Louisiana, and South Liberty, Tex., in which important new production has been added recently, daily average production for the Gulf Coast as a whole continued steady the past week, a gain of only 309 bbls. being shown. Total daily average production was 131,983 bbls. Figures by fields for the Gulf Coast and also Southwest Texas are:

GULF COAST

Texas

Allen Dome	7
Barbers Hill	510
Batson	1,330
Big Creek	2,026
Blue Ridge	5,559
Brenham	150
Boling	2,542
Damon Mound	650
DeWalt	4,522
Fannette	19
*Gay Hill	....
Goose Creek	6,794
High Island	799
Hull	10,861
Humble	4,011
Markham	285
Nash Dome	1,090
North Dayton	690
Orange	3,539
Orchard	149
Pierce Junction	9,165
Raccoon Bend	675
Saratoga	992
Sour Lake	2,958
South Liberty & Dayton	5,740
Spindletop	37,352
West Columbia	7,760
Total this week	110,175
Total last week	111,178
Decrease	1,003

*Shut in.

South Louisiana

Anse La Butte	46
Atchafalaya	890
East Hackberry	5,707
Edgerly	747
Evangeline	910
Lockport	3,747
Loreauville	1
Sorrento	559
Starks	1,054
Sulphur	2,000
Sweet Lake	1,850
Vinton	4,262
Welsh	35
Total this week	21,808
Total last week	20,496
Increase	1,312
Total Gulf Coast	131,983
Total last week	131,674
Increase	309

SOUTHWEST TEXAS

Dale	709
Kingsville	287
Luling	13,365
Lyfton Springs	1,175
Refugio	400
Somerset	1,985
Mirando District	13,343
Total this week	31,254
Total last week	31,370
Decrease	116

Pierce Junction

Pierce Junction's two good completions were Shaw-Texas Exploration Co.'s No. 2-E Fitzsimmons and Navarro Oil Co.-Texas Exploration Co.'s No. 11 Dooley. The former is on the north edge of production on the north flank and came in flowing 900 bbls. of 21.3 gravity pipe line oil from sand at 3,791 feet. The Dooley well on the east flank is an old producer deepened to 4,595 feet, where it made 1,500 bbls. daily through 2½-inch tubing with a three-eighths-inch choke.

Other completions included: Yount Lee Oil Co.'s No. 20 Gladys City, Spindletop, an old well deepened to 3,424 feet, flowing 200 bbls.; this company's No. 20 McFaddin, same field, a work over, 200 bbls. fluid, 20 per cent oil, sand 3,115 feet; same company's No. 6 fee, Spindletop, an old well deepened to 3,909 feet, flowing 250 bbls. through tubing and chokes.

Barbers Hill—Chambers County

Bennett Petroleum Co.'s No. 2 Kirby is drilling gumbo at 2,882 feet. Humphreys Corp.'s No. 1 Higgins tested fresh water in a shallow sand at 504-25 feet and is drilling deeper to 535 feet. This company's No. 1-C Kirby is drilling gumbo at 2,950 feet. No. 3-A Barber is drilling anhydrite and black shale at 2,435 feet. Yount Lee Oil Co.'s No. 1 Chambers is drilling sand at 2,068 feet and its No. 1 Richardson is in sand and shale at 1,451 feet. Humphreys Corp.'s No. 6-B Kirby and No. 1 Cornelia Barbers are rigged up and Bennett Petroleum Co.'s No. 2 Smith is a derrick. Bennett's No. 1 Smith still is trying to pull drill stem.

Boling—Fort Bend and Wharton

Gulf Production Co.'s No. 2 E. C. Farmer, east flank, is drilling gumbo at 3,419 feet. Heep & Hawn's No. 1 River Bed is in gumbo at 500 feet. Scott & Peck's No. 1 Armstrong is in gumbo at 1,571 feet. Sun Oil Co.'s No. 5 E. C. Farmer is drilling in salt at 3,677 feet and probably will be abandoned this week. The latter company has a rig up for No. 4 Kasparek as has The Texas Company one for No. 1 Dipple. Vacuum Oil Co.'s No. 1 Kasparek is a location.

On the southwest side, The Texas Company's No. 12-A Taylor is drilling sand and shale with a slight showing of oil at 3,932 feet. This company's No. 2-B Taylor is in sand and shale at 3,236 feet.

Blue Ridge—Fort Bend County

Sinclair Oil & Gas Co.'s No. 3 Davison on the east flank, an old well being deepened, is drilling shale at 3,720 feet. South Texas Petroleum Co.'s No. 1 Gabe Lee is to be deepened and is drilling sandy shale at 4,060 feet. This company also is to work over its No. 4 Davison. Gulf Production Co.'s No. 16-B Blakely is drilling gumbo at 1,635 feet. This company's No. 5 Invincible, an old well being deepened, is drilling at 3,773 feet.

On the south flank, Humphreys Corp. has started deepening its No. 3 West-Schenck. J. S. Abercrombie's No. 4 West Schenck, in the same district, is drilling at 3,536 feet.

On the north and northwest, Navarro Oil Co.'s No. 7-A Robinson has been delayed by a fishing job after drilling to 682 feet in gumbo but is sidetracking at 422 feet. Watts Oil Co.'s No. 3 Scott is drilling gumbo at 4,517 feet. This company's No. 9 Blakely is drilling below 3,215 feet. Blakely & Mean's No. 1 Blakely, an old well, is drilling below 3,551 feet.

Big Creek—Fort Bend County

Gulf Production Co. has encountered an oil showing sand at 3,173 feet in its No. 14 Davis, an old well deepened, and as the week closed had set strainer to test. Gulf's No. 50 Davis has started drilling and is down 1,800 feet. Navarro Oil Co.'s No. 2 Davis is drilling gumbo at 675 feet and The Texas Company's No. 4 Wheat is in gumbo at 1,339 feet.

Nash—Fort Bend and Brazoria

Humble Oil & Refining Co.-Rycade Oil Corp.'s No. 1 Wisdom is drilling shale at 4,237 feet. Rycade Oil Corp.'s No. 13 Wisdom has started deepening and is coring below 3,822 feet in sand at which depth it was completed in October as a 50-bbl. well. No. 24 Wisdom again

(Continued on Page 141)

BUTLER COUNTY, PENNSYLVANIA, HAS 335-BARREL COMPLETION

By D. S. Wakenight
Staff Correspondent, Eastern Fields

PITTSBURGH, Pa., Nov. 26.—There were fewer wells completed than during the previous week, but some were much larger producers. Weather conditions were very favorable and in some sections operators are taking advantage of it to start or complete new work. The demand for crude of the Pennsylvania grade has never been so great. The only chance for new production at this time is in the West Virginia fields in Jackson or Wayne Counties where some light wells have been completed recently.

The deep-sand territory in southeast Ohio for the first time in several months has completed a near gusher, the Hope Construction & Refining Co.'s test on the W. E. Helphsey farm, Section 5, Jackson Township, Muskingum County. It produced 255 bbls. the first 24 hours after completed and shot in the Clinton sand.

In the southwest quarter of Section 24, Green Township, Hocking County, Perry Sturm and others completed a test on the Woodrow heirs' farm good for 75 bbls. a day. In the southeast quarter of Section 8, Fallsbury Township, Licking County, the W. & M. Oil Co. has a 75-bbl. producer on the J. W. Little farm.

In the northwest quarter of Section 34, Coal Township, Perry County, the Preston Oil Co. completed and shot in the Clinton sand No. 124 on the Sunday Creek Coal Co.'s property which produced 65 bbls. the first 24 hours.

In Clay district, Muskingum County, Cline, Foraker and others have a Clinton. sand gasser good for 1,000,000 feet on the Alice Ashcraft farm. In Fallsbury Township, Licking County, J. W. Cashdollar got a fair gasser on the Helen Young farm.

In Section 9, Perry Township, Licking County, M. F. Whitehill completed in the Berea grit No. 6 on the Alice Ashcraft farm, a 12-bbl. pumper. In the northwest quarter of Section 7, Enoch Township, Noble County, the Merger Oil & Gas Co. has a very light pumper in the Buell Run sand.

Duster in Hocking County

In Section 15, Washington Township, Hocking County, the Ohio Fuel Gas Co. has a duster on the M. Engle farm. One mile north of Amesville, fraction Section 34, Berne Township, Athens County, C. F. Fox found no sand at his test on the W. R. Goddard farm. It is a duster. One and one-half miles west of Amesville, Section 8, Ames Township, Charles Mosier and others have a light gasser in the stray sand on E. Phillips farm. In Section 33, Berne Township, Morgan County, Harry J. Smith & Co. have a duster in the Peeker sand at No. 6 on the Charles C. Curtis farm.

In the northeast quarter of Section 1, Perry Township, Licking County, Geddes & Co. got better than an average pumper when it shot in the Clinton sand No. 5 on the Joseph Chaney farm. It produced 25 bbls. the first 24 hours. In Section 10, Fallsbury Township, the Preston Oil Co.'s second test on the N. L. Norris farm is a 5-bbl. pumper in the Berea grit. In the same section and township, the Emeral Petroleum Co. has a 5-bbl. pumper in the same formation at its No. 10 on the G. W. Chapin farm.

In Aurelius Township, Washington County, Elmer Wickens completed in the Macksburg 500-foot sand No. 5 on the Henry Wickens farm. It is a very light

(Continued on Page 137)

Donovan Boilers are Consistently Good

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Santa Fe Springs Starts Big Parade

Five Wells Finished in Deep Zone, 40 More to Be Completed Before New Year, With Production Going Upward

By L. P. Stockman
Staff Correspondent, California Fields

LOS ANGELES, Calif., Nov. 24.—The big parade at Santa Fe Springs got under way to an auspicious start when five new wells were finished in the deep zone and, with additional completions scheduled to become numerous until the initial peak is reached early next year, field production is destined to show a consistent upward trend for several months, notwithstanding proration of production and gas conservation measures are to be undertaken. Deep-zone production approximates 47,000 bbls. per day but this will be greatly augmented within 60 days. A check made indicates the probable completion of 40 drilling projects before the close of the year and if this group runs true to form the output at Santa Fe Springs will exceed 100,000 bbls. daily before New Year and continue this rapid ascent during early in 1929, unless production is drastically restricted as a result of conservation work. There are 227 strings of tools in operation and progress charts show 30 wells rotating below 5,000 feet, 122 between 4,000 and 5,000 feet, 46 between 3,000 and 4,000 feet and 27 above the 3,000-foot level. Eighteen additional derricks are either in construction or being rigged up.

Increased Production

With Santa Fe Springs destined to reach a minimum daily peak production of at least 150,000 bbls. regardless of pending conservation work, and several other fields also expected to show increased production during the next several months, the outlook in California can not be considered promising. Several months ago the prediction was made that State production would exceed 750,000 bbls. per day before March 1, 1929, and recent developments indicate it will be greatly exceeded unless a major statewide curtailment alleviates conditions expected to result from deep-zone exploitation at Santa Fe Springs and additional development work at Elwood, Ventura Avenue, Kettleman Hills, Midway-Sunset and possibly at Rincon also if the lower zone is found sufficiently productive to warrant deep drilling. Long Beach is slipping gradually but no substantial decline should be anticipated there for a few months as there are 186 drilling wells under way. The initial daily production of new wells in this district has shown a very heavy decline during the past 60 days but there are still many favorably located projects which should register fairly large production. The northwest extension and Los Cerritos section of Long Beach Field may subsequently prove important factors if deep drilling is successful and the anticipated decline temporarily arrested. The recently discovered Kettleman Hills Field of Kings County can not be expected to register large production until late in 1929 at the earliest as it requires deep drilling. Subsequent exploration work may reveal sands above that now producing from below the 7,000-foot level. The Elwood Field of Santa Barbara County, however, may prove an important factor early in 1929 as prolific production is secured at unusually shallow depths, around 3,400 feet. This field is in good hands, however, and while the Barnsdall Oil Co. will not purposely develop substantial production, stringent lease obligations require consistent development with the result that the potential output may exceed 25,000 bbls. daily within four months. Present production approximates 10,000 bbls. daily from three wells, all finished by the Barnsdall.

Conservation Imperative

There has been a very marked tendency upon the part of California operators during the past six months to cooperate and this commendable policy may result in a general readjustment so State production can be held within bounds to the mutual benefit of both producer and consumer. Unless regulated, production may easily exceed 800,000 bbls. daily within six months. It is imperative some constructive action be taken immediately to effect a mutual conciliation among all producers operating in flush fields as the situation may ultimately develop into a free for all. The winter season is approaching with its normal seasonal drop in consumption and this may force independent refiners to dump gasoline and refined oil on the market at distress prices, although this may be prevented if the Santa Fe Springs' proration committee receives the hearty support of all individual producers and begins functioning with as little delay as possible. It remains to be seen just how effective the proposed crude oil curtailment at Santa Fe Springs will be as it is based on mutual co-operation among producers. Many operators have signified their intention of co-operating to the fullest extent but unless this policy is universal the movement will be impaired and may result in compulsary regulation. Rumors have been in circulation that one independent producer running eight strings of tools in the town lot section at Santa Fe Springs will not become a party to the proposed program. This concern recently purchased sufficent acreage to hold 20 large steel tanks and it is reported tentative plans have been prepared calling for the erection of 1,000,000 bbls. of new steel storage.

Effect on Shipments

The anticipated major increase expected to occur in State production as a result of deep-zone exploitation at Santa Fe Springs, and additional development work at Elwood, Ventura Avenue, Midway-Sunset and other areas, is of special significance as this flood of oil may exert an appreciable influence on intercoastal and export shipments of crude and refined oils. Tanker shipments during 1928 show a substantial change from similar movements made up to the same time last year and a reversal of policy may take place early in 1929 if State production proves larger than expected. During 1927 California operators shipped 9,438,126 bbls. of crude oil and 8,374,388 bbls. of gasoline to Atlantic and Gulf Coast ports up to November 24. This year only 2,988,419 bbls. of crude oil have left Los Angeles Harbor in the intercoastal trade to the same time but gasoline shipments have been 12,639,535 bbls. an increase of more than 50 per cent over 1927. The fuel oil situation also showed a substantial reversal as only 143,471 bbls. have left Los Angeles Harbor for the East Coast up to the present compared with 6,788,773 bbls. for a similar period in 1927. Exports of fuel oil to foreign ports have also shown a substantial drop this year, the figures being 19,997,955 bbls. for the current year to date and 25,969,735 bbls. for the same time last year. Exports of gasoline and kerosene, on the other hand, both show substantial gains over 1927. It is likely intercoastal shipments of crude oil to Atlantic and Gulf Coast ports will be greatly stimulated for several months, in fact there has already been a noticeable tendency along this line. During the early part of 1928 crude shipments to the East Coast were quite frequent but in the summer these movements ceased entirely and were supplanted by increased liftings of gasoline. Crude oil shipments to the Atlantic Coast were resumed again several weeks ago and a total of 148,837 bbls. left Los Angeles Harbor last week.

Natural Gas Conservation

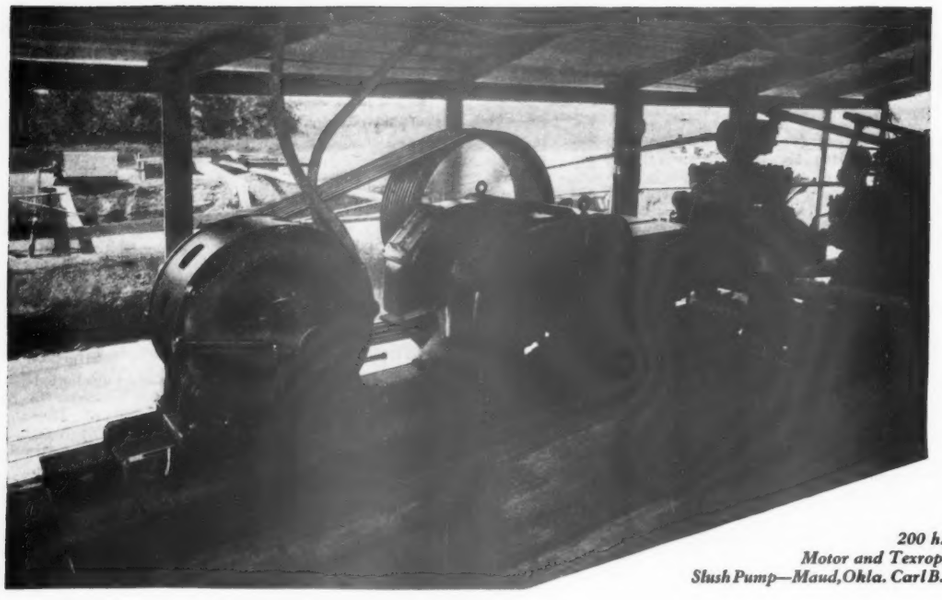
California is producing more than 1,000,000,000 feet of natural gas daily at present, notwithstanding statewide conservation work which has been in force in several fields for more than six months and from indications another 500,000,000 feet will be added as a result of deep-zone exploitation at Santa Fe Springs and additional drilling at Elwood and other fields. Most of this enormous quantity of gas is coming from flush Los Angeles Basin fields although the Ventura Avenue Field is yielding more than 250,000,000 feet daily. To reduce gas waste to a minimum approximately 50,000,000 feet is being used daily for repressuring work but this will be greatly increased, especially when operators begin repressuring the Meyer horizon at Santa Fe Springs. About 300,000,000 feet daily is being utilized by domestic and industrial consumers and an additional 500,000,000 feet is being burned as fuel by

IMPORTANT SOUTHERN CALIFORNIA WILDCATS

Company, well and location—	S-T-R	Depth	Status
Ring Pet. Co., No. 1 Inglewood, Los Angeles Co.	28- 2-14	4,352	suspended
Mont. Park Oil Co., No. 1 Browning, Monterey Park	26- 1-12	4,420	suspended
Mont. Park Pet. Co., No. 1 Jepson, Monterey Park	25- 1-12	3,509	sd. sh. drilling
World Pet. Corp., No. 1 Bell, Los Angeles Co.	22- 3-12	2,915	suspended
Associated, No. 1 Taylor, Los Angeles Co.	33- 2-12	5,030	cemented
Empire Drlg. Co., No. 1 Bell, Los Angeles Co.	14- 2-12	4,502	suspended
Continental Oil Co., No. 1 La Mirada, Los Angeles Co.	10- 3-11	4,521	hd. sd. drilling
Shell, No. 2 Mission, San Fernando	4- 2-15	5,521	gr. sh. drilling
Andrews, Otis, No. 1 Lancaster, Los Angeles Co.	23- 8-13	2,080	suspended
Security Pet. Co., No. 1 Lynwood, Los Angeles Co.	13- 3-13	5,333	suspended
Richfield, No. 1 Maywood, Los Angeles Co.	13- 2-13	914	hd. sd. drilling
Harding, J. B., No. 1 Watts, Los Angeles Co.	17- 3-13	579	water trouble
Easton & Smith, No. 1 Calabasas, Los Angeles Co.	19- 1-17	2,982	suspended
Russell Oil Co., No. 2 Joughin, Los Angeles Co.	25- 3-17	1,008	suspended
Mallory, Ellis, No. 1 Manhattan, Los Angeles Co.	30- 3-14	125	suspended
Pomona Oil Co., Well No. 1, Los Angeles Co.	32- 1- 8	1,075	clean. out
Anchor Oil Co., No. 1 Puente, Los Angeles Co.	19- 2-10	4,820	suspended
Richfield Oil Co., No. 1 Puente, Los Angeles Co.	9- 2-10	2,370	sd. sh. drilling
Calif. Eastern, No. 1 Wickham, Los Angeles Co.	32- 5-17	2,094	hd. sd. drilling
The Texas Company, No. 1 Anaheim, Orange Co.	35- 4-10	988	sd. drilling
Bastanchury Ranch Co., Well No. 1, Orange Co.	21- 3-10	Rig	suspended
Mesa Pet., No. 1 Newport, Orange Co.	21- 6-10	3,255	recemented
West. Drlg. & Prod. Co., No. 1 Newport, Orange Co.	18- 6-10	2,249	gr. sd. drilling
Steel, F. L., No. 1 Stanton, Orange Co.	24- 4-11	Mtl.	building rig
Hall Pet. Co., No. 1 Murrietta, Riverside Co.	23- 7- 3	931	cleaning out
Hemet Pet. Co., No. 1 Ward, Riverside Co.	9- 5- 1	3,060	hd. sd. drilling
Davenport Oil & Gas Co., No. 1 San Marcos, San Diego Co.	30-12- 2	865	hd. sd. drilling
Turner, S. S., No. 1 Escondido, San Diego Co.	25-12- 2	1,527	cemented
Torrey Pines Oil Co., Well No. 1, San Diego Co.	18-14- 3	1,974	suspended

IMPORTANT NORTHERN CALIFORNIA WILDCATS

Milham Explts., No. 1 Kettleman, Kings Co.	2-22-17	7,235	3,750 bbls.
Standard, No. 71 fee Kettleman, Kings Co.	11-22-17	Mtl.	building rig
Standard, No. 28 fee Kettleman, Kings Co.	1-22-17	....	location
Bolsa Chica, No. 1 Kettleman, Kings Co.	20-25-19	3,502	suspended
Bolsa Chica, No. 2 Kettleman, Kings Co.	20-22-18	...	location
California Oil Co., No. 1 Kettleman, Kings Co.	12-23-19	Rig	suspended
General Pet. Co., No. 2 Ochsner, Kettleman Hills	26-22-18	6,755	cleaning out
Miley Oil Co., Well No. 1, Kettleman Hills	24-22-18	Mtl.	building rig
South Coalinga, Well No. 1, Kettleman Hills	35-24-19	3,140	suspended
Monocline Dev. Co., Well No. 1, Kettleman Hills	7-21-21	4,308	suspended
McPhail, Hugh, Well No. 1, Kettleman Hills	13-24-18	2,100	suspended
California Western Oil Co., No. 1 Elkins, Ventura Co.	28- 4-19	2,951	testing
Exline, Emma, No. 1 Saticoy, Ventura Co.	33- 3-21	2,412	fishing
Ohio Oil Co., No. 1 Saticoy, Ventura Co.	32- 3-21	1,580	br. sh. drilling
Standard, No. 5 Saticoy, Ventura Co.	1- 2-22	3,497	hd. sd. drilling
Petroleum Sec., No. 1 Diablo, Ventura Co.	26- 5-18	6,380	hd. sd. drilling
American Oil Co., No. 1 Camarillo, Ventura Co.	33- 2-20	561	suspended
Star Pet. Co., No. 2 Canet, Ventura Co.	13- 3-23	6,775	suspended
Shell, No. 1 Grubb, Ventura Co.	27- 2-22	5,310	abandoned
Bolsa Chica, No. 1 Temescal, Ventura Co.	3- 4-18	Mtl.	building rig
Miley, E. J., No. 2 Casitas, Ventura Co.	12- 3-21	785	sd. sh. drilling
Shell, No. 2 Berlywood, Moorpark	33- 3-20	7,240	abandoned
Continental, No. 1 Sulphur Mountain, Ventura Co.	21- 4-22	2,480	br. sh. drilling
Continental, No. 2 Sulphur Mountain, Ventura Co.	22- 4-22	2,797	fishing
Milham Explts., No. 1-A Buttonwillow, Kern Co.	8-28-23	4,662	gas well
Milham Explts., No. 2 Buttonwillow, Kern Co.	8-28-23	2,730	gas well
Milham Explts., No. 3 Buttonwillow, Kern Co.	8-28-23	2,694	gas well
Milham Explts., No. 4 Buttonwillow, Kern Co.	6-28-23	2,670	gas well
Milham Explts., No. 5 Buttonwillow, Kern Co.	5-28-23	2,500	gas well
Milham Explts., No. 6 Buttonwillow, Kern Co.	8-28-23	2,676	gas well
Milham Explts., No. 7 Buttonwillow, Kern Co.	6-28-23	2,720	suspended
Milham Explts., No. 8 Buttonwillow, Kern Co.	16-28-23	4,045	hd. sd. drilling
Doheny-Stone, No. 1 Salisbury, Kern Co.	7-29-24	4,291	fishing
South. Calif. Gas Co., No. 1 Buttonwillow, Kern Co.	4-28-23	4,272	suspended
South. Calif. Gas Co., No. 2 Buttonwillow, Kern Co.	27-28-23	Rig	suspended
Richfield Oil Co., No. 1 Semitropic, Kern Co.	21-26-22	4,450	sd. sh. drilling
Pacific Eastern, No. 1 Union Ave., Kern Co.	6-30-28	5,640	suspended
Pacific Eastern, No. 2 Union Ave., Kern Co.	6-30-28	4,500	suspended
Pacific Eastern, No. 3 Union Ave., Kern Co.	6-30-28	4,443	gas, shut in
Pacific Eastern, No. 5 Union Ave., Kern Co.	5-30-28	4,991	suspended
Stabler, W. W., No. 1 Comanche Point, Kern Co.	23-32-29	2,860	fishing
General Pet., No. 3 Edison, Kern Co.	5-30-29	2,090	hd. sd. drilling
Midway Northern, No. 1 Edison, Kern Co.	29-29-30	3,775	suspended
Deizel, S. A., No. 1 Delano, Kern Co.	4-26-27	3,116	suspended
Elmer Oil Co., No. 1 Shafter, Kern Co.	8-28-25	3,907	sd. sh. drilling
Standard, No. 1 San Emidio, Kern Co.	35-11-22	3,015	fishing
Union, No. 1 San Emidio, Kern Co.	5-10-21	118	sd. drilling
Perry, C., No. 1 McFarland, Kern Co.	34-26-26	195	sd. drilling
Fresno Madera Oil Co., No. 1 Clovis, Fresno	18-21-21	4,194	suspended
Currency Pet. Co., No. 1 Vineyard, Fresno Co.	28-21-14	741	sd. drilling
Union, No. 1 Huasna, San Luis Obispo	34-32-15	3,184	br. sh. drilling
Union, No. 1 North Huasna, San Luis Obispo Co.	12-32-14	2,179	hd. sd. drilling
Panorama Oil Co., Well No. 1, San Luis Obispo Co.	7-31-21	3,110	br. sh. drilling
Sequoia Oil Co., Well No. 2, San Mateo Co.	15- 7- 5	1,605	suspended
Sunset Pacific, No. 1 Saratoga, San Mateo Co.	13- 7- 4	Rig	suspended
Shell, No. 2 Cowell, San Mateo Co.	8- 6- 5	3,694	abandoned
Shell, No. 1 Butts, San Mateo Co.	16- 6- 5	3,342	suspended
Shell, No. 3 Petaluma, Sonoma Co.	8- 5- 7	1,363	hd. sd. drilling
Calhoma Oil Co., No. 1 Livermore, Alameda Co.	9- 3- 3	1,350	suspended
Foster & Hammill, Well No. 1, Alameda Co.	21- 3- 3	Rig	suspended
R. Y. Hanlyn, Well No. 1, Alameda Co.	3- 5- 2	341	hd. sd. drilling
Shell, No. 1 Refugio, Santa Barbara Co.	31- 5-30	Mtl.	building rig
Standard, No. 1 Lompoc, Santa Barbara Co.	.....	Rig	rigging up
Standard, No. 1 Arguello, Santa Barbara Co.	1- 4-34	Mtl.	building rig
Tepesquit Oil Co., Well No. 1, Santa Barbara Co.	3- 9-32	2,710	suspended
Becker, George F., No. 1 Summerland, Santa Barbara Co.	33- 4-25	3,090	suspended
Continental, No. 1 Carpenteria, Santa Barbara Co.	33- 4-25	2,100	redrilling
Southwest Prod. Co., Well No. 1, Santa Barbara Co.	2- 4-28	1,953	hd. sd. drilling
Colus Oil Co., Well No. 1, Colusa Co.	31-15- 4	350	redrilling
Nuna Oil Co., Well No. 1, Colusa Co.	19-15- 5	400	hd. sd. drilling
Superior Oil Co., No. 1 Calivada, Colusa Co.	31-15- 4	1,011	suspended
North Counties Oil Co., Well No. 2, Humboldt Co.	36- 2- 1	2,205	suspended
Humboldt Oil Co., Well No. 1, Humboldt Co.	6- 2- 1	2,041	redrilling
Kuhns, H. L., Well No. 1, Merced Co.	9-12- 9	1,526	hd. sd. drilling



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refiners and operators in the field. Production of natural gas at Santa Fe Springs is expected to show a tremendous increase for several months and while engineers' estimates place the peak at approximately 300,000,000 feet daily it may go considerably higher. Twelve producing wells have been finished in the deep zone at Santa Fe Springs and these projects are producing 46,500 bbls. of oil and 61,350,000 feet of wet gas daily, an average per well of 3,875 bbls. of oil and 5,121,000 feet of gas daily. The deep zone at Santa Fe Springs is not showing an unusually high gas-oil ratio as only one well out of the first 12 finished has an unfavorable average. This project, the Star Petroleum's No. 2, is flowing 2,730 bbls. of oil and 25,000,000 feet of natural gas daily.

A special subcommittee of the operators' general committee on gas conservation has prepared tentative plans for the conservation of surplus gas at Long Beach based on proration of gas production and a concerted attempt will be made to effect a substantial reduction. This subcommittee, which has been studying the situation at Long Beach for more than a month, has compiled an estimate on actual production and disposal of natural gas in that field and is of the opinion that a gas surplus will continue to exist until about October, 1929, after which period the surplus will decline rapidly. About 123,000,000 feet of natural gas is blown off into the air in this district daily and this condition will probably continue for six months at least, and maybe longer. A careful survey reveals that this wastage of natural gas can be reduced about one-half without imposing any undue hardship on any operator. This would mean the conservation of over 60,000,000 feet of natural gas daily if present plans are carried out. To do this the operators' general committee on gas conservation proposes to curtail gas production approximately 17 per cent. This can be accomplished either through the pinching in production or by repressuring operations. The method to be followed is optional with each producer. The committee pointed out that the curtailment of 17 per cent in gas production does not necessarily mean curtailment of oil production to this extent because the required gas curtailment may in many cases be secured with losses of present oil production of less than 10 per cent. The general committee recommended that the proposed proration program at Long Beach be placed in the hands of an engineering committee and every effort made to effect a mutual arbitrary reduction.

Santa Fe Springs

The Wilshire Oil Co. added a new well to its deep-zone producers at Santa Fe Springs early in the week when its No. 1-B Cecelia blew in doing 4,400 bbls. of 35.3 gravity oil and 5,000,000 feet of natural gas daily from 5,750 feet and was followed into production by No. 6 Blanchard of the Universal Consolidated Oil Co., which started off flowing 3,720 bbls. of 35.2 gravity oil and 1,700,000 feet of wet gas daily from 5,789 feet. The existence of two separate zones at Santa Fe Springs has been definitely established by an intermediate shale body approximating 60 feet in thickness and future completions for some time will probably be restricted to one or the other as the first attempt to produce from both zones simultaneously was not very satisfactory. Two wells have been finished in the Nordstrum zone, which is between the Meyer and deeper Buckbee horizon, and both of these projects have shown favorable production. George F. Getty's No. 17 Nordstrum, the initial completion in this zone, is producing 5,925 bbls of oil and 8,000,000 feet of natural gas daily at 5,409 feet. This well and the Star Petroleum Co.'s No. 2, which is flowing 2,730 bbls. and 25,000,000 feet of wet gas daily from 5,535 feet, comprise the only two wells completed in this zone. There are 10 wells producing from the Buckbee sand, the Universal Colsolidated and the Wilshire Oil Co. each having finished two large producers. The Buckbee horizon is yielding 38,500 bbls. of refining crude and 28,350,000 feet of wet gas daily, compared with 8,500 bbls. of oil and 33,000,000 feet of saturated gas daily from the intermediate Nordstrum zone.

The Bellview Oil Co.'s No. 2 Grohs, which blew in out of control on November 9 and took fire almost immediately, is still burning with unabated fury and work has been suspended on a number of drilling projects because of the fire hazard and in some cases loss of equipment. Sixteen companies have formed a pool to bring this well under control. Contributing companies, consisting of The Texas Company, Associated, Union, Shell, Standard, Richfield, General Petroleum, Wilshire, George F. Getty, Superior, Twin Bell, California Eastern, Universal Consolidated, York & Lockhart and Oscar R. Howard, appointed an operating committee a few days ago consisting of H. H. Maddren of The Texas Company, L. B. Little of the Standard Oil Co. and F. F. Hill of the Union Oil Co. These three immediately appointed C. W. Eckles as superintending engineer in charge of control work. A tunnel was started several days ago to intercept the casing 45 feet below the surface and satisfactory progress is being made. About 20 feet is being made daily and this tunnel should be finished during the week, unless unforeseen difficulty is encountered. The Bellview's gasser is causing considerable economic loss and this dissipation of gas will subsequently be reflected in production figures. York & Lockhart's No. 1 McKeon, a recent completion doing 3,015 bbls. per day from 5,707 feet, is within 200 feet of this big gasser. Production has shown an abnormal drop due undoubtedly to the enormous amount of gas being burned in No. 2 Grohs.

Long Beach

There were a number of completions chalked up in the Long Beach Field, several of which proved very satisfactory. The Shell accounted for two and incidentally increased its daily production 1,487 bbls. The company started off with No. 8 Nesa, which came in flowing 525 bbls. of 28.7 gravity oil daily from 7,305 feet and concluded with No. 6 Marcellus, which blew in doing 962 bbls. of 29.8 gravity oil daily from 7,015 feet. No. 7 Dobyns was given a production test from 7,514 feet but rotary mud from other projects prevented final completion and it will require further work. The Petroleum Co.'s No. 3 Beck registered an initial daily production of 1,870 bbls. daily from 6,095 feet, the hole having been finished with a 6⅝-inch oil string carrying 465 feet of perforated. The largest well finished was J. O. Seeple's No. 3 Maltby, recompleted after being redrilled and deepened from 6,143 feet to 6,610 feet, was finished with a 4¾-inch oil string carrying 350 feet of perforated. This well, returned to production late in the week, came in flowing 3,270 bbls. of exceptionally clean 30.9 gravity oil and 2,100,000 feet of wet gas daily. The Texas Company's No. 4 on Foster lease No. 1, a new well, is credited with an initial daily production of 1,700 bbls. from 6,340 feet, the oil being clean and testing 30.2 degrees. Boyd & Hammond's No. 1, another new well, was given a chance to make a bid for production early in the week from 6,742 feet but with the initial output, 310 bbls. daily, cutting 20 per cent, further work will be required.

Seal Beach

The Standard Oil Co. recompleted No. 10 San Gabriel in the Seal Beach Field of Los Angeles Basin after redrilling and deepening it from 4,760 feet to 5,451 feet. This well, finished with a 6⅝-inch oil string landed at 5,202 feet, was returned to production flowing 2,406 bbls. of exceptionally clean 27.4 gravity oil daily. The Standard is running two additional strings of tools on this lease and should have No. 15 on production soon. The Marland should also finish another well or two in this field during the next 10 days as Nos. 24 and 25 on the Bixby lease are both eligible for completion. The Texas Cmpany is reaming No. 1 Lovell in the Alamitos Heights section of the Seal Beach Field preparatory to landing the oil string around 6,285 feet. There were no developments of special importance in the Potrero Field of Los Angeles Basin as No. 1 Voorhes of the Associated Oil Co. is standing capped at 6,411 feet after running wild for several days. The company's No. 3 Cypress in this field is rotating in the oil sand at 4,650 feet and should be tanking oil within two weeks. The Barnsdall Oil Co. is working on two projects in the Rosecrans Field and since both, No. 1 Rosecrans and No. 13 O'Dea, are rotating in the oil sand they should be completed soon.

Ventura Avenue

The Bolsa Chica Oil Co.'s No. 3 Hartman, finished in the Ventura Avenue Field, has been severely beaned down for protection purposes and is making 3,475 bbls. of clean 32.1 gravity oil and 5,400,000 feet of wet gas daily. The crew was immediately transferred to No. 2 Hartman, a former shallow producer, which will be redrilled and deepened to the approximate depth at which No. 3 was completed, 7,210 feet. Drilling will be resumed in No. 2 at 6,602 feet and with the addition of another 1,000 feet of hole production should be substantially increased. The Bolsa Chica recently completed the installation of another unit at its absorption plant and no difficulty will be experienced in handling increased production of natural gas for several months. A check of drilling operations under way in the Ventura Avenue Field indicates the probable completion of at least 10 wells before the close of the current year, and if these new projects run according to schedule daily production should show an upward trend. The Richfield Oil Co.'s No. 1 Miley, in the Rincon Field of Ventura County, failed to result in substantial production when given a production test from the deep zone at 6,532 feet. This well came in flowing 600 bbls. of fluid, most of it salt water, and the outlook is somewhat dubious. Corrective work has just been undertaken and the company's field department has hopes of developing commercial production as core samples indicated a rather promising oil sand. The Elmer Oil Co. is expected to make a production test of its No. 1 Rincon shortly and the outcome will be watched with considerable interest as it is in the Muscle Rock area, a little over 1 mile northwest of production.

TANKER SHIPMENTS FROM LOS ANGELES TO ATLANTIC AND GULF COAST PORTS

Commodity—	Total this week	Daily average	Total last week	Daily average	This year to date	Same time last year
Crude oil	148,837	21,262	.....	.....	2,988,419	9,438,126
Fuel oil	.....	.....	.....	.....	143,471	6,788,773
Diesel and gas oil	.....	.....	.....	.....	1,745,589	2,375,151
Gasoline	394,973	43,568	338,556	48,365	12,639,535	8,374,388
Tops	.....	.....	.....	.....	339,100	.....
Coastwise—						
Crude oil	336,199	48,028	415,111	59,302	21,443,530	22,171,802
Fuel oil	400,364	57,195	459,090	65,584	15,007,550	12,037,578
Diesel and gas oil	16,548	2,364	31,647	4,521	1,011,975	365,413
Gasoline	183,276	26,182	248,118	35,445	8,365,520	9,218,564
Kerosene	.....	.....	.....	.....	66,757	235,419
Tops	.....	.....	.....	.....	171,566	259,375
Exports—						
Crude oil	55,350	7,907	63,250	9,036	1,958,932	2,138,240
Fuel oil	330,434	47,205	445,643	63,663	19,997,955	25,969,735
Diesel and gas oil	33,817	4,831	32,781	4,683	2,033,938	1,307,134
Gasoline	149,580	21,369	250,598	35,800	6,722,000	4,824,147
Tops	.....	.....	.....	.....	.....	302,303
Kerosene	.....	.....	177,589	25,370	3,719,590	1,978,832

TANKER SHIPMENTS FROM SAN FRANCISCO TO ATLANTIC, GULF COAST PORTS

Diesel and gas oil	75,763	10,823	.....	.....	418,188	900,061
Gasoline	169,928	24,275	79,963	11,423	2,000,060	2,042,773
Lubricants	.....	.....	.....	.....	277,151	439,357
Coastwise—						
Fuel oil	.....	.....	4,002	572	3,054,074	4,692,389
Diesel and gas oil	7,993	1,142	3,993	570	279,197	223,583
Gasoline	94,786	13,541	101,274	14,468	4,320,382	4,688,674
Kerosene	.....	.....	.....	.....	214,441	213,109
Exports—						
Crude oil	.....	.....	.....	.....	96,250	.....
Fuel oil	.....	.....	.....	.....	2,063,154	2,480,203
Diesel and gas oil	.....	.....	45,780	6,540	56,180	.....
Gasoline	67,530	9,647	64,029	9,147	3,954,277	2,678,443
Kerosene	89,724	14,246	65,493	9,356	625,977	897,155
Lubricants	.....	.....	.....	.....	33,535	26,695

GAS CONSERVATION AT MUSKEGON FOLLOWS AGREEMENT OF OPERATORS

By Special Correspondent

MUSKEGON, Mich., Nov. 24.—Wastage of natural gas in the Muskegon Field was reduced to a maximum of 2,000 feet for each barrel of oil produced by a five-day gentlemen's agreement formulated November 21 following a general meeting of the operators.

Representatives of each of the companies owning large gas and oil wells in the Dundee formation from which an aggregate of about 25,000,000 feet of gas is said to have been wasted daily, were named members of the committee which formulated the temporary agreement.

Special meetings of the committee, composed of 15 operators and contractors, have been held daily since the general meeting to work out a permanent agreement on the basis of which all of the wells will be allowed to produce some oil but will be expected to conserve gas.

Under the temporary agreement it is estimated not more than 5,000,000 feet of gas a day is being wasted from the large Dundee wells. About 2,000,000 feet of gas a day is still flowing into the air from the producing wells in the upper Traverse formation. Since the aggregate open flow is more than 200,000,000 feet of gas a day the present wastage is estimated to be less than 4 per cent.

Beverly H. Tucker, state field supervisor and inspector, made four definite recommendations at the general operators' meeting.

That the excess gas be conserved by pinching in each producing oil and gas well to allow no more than 2,000 feet of gas to be used to produce each barrel of oil.

That a flow of 5,000,000 feet of gas a day shall be the point at which a well shall be designated as a gas well and that drilling be discontinued until this amount of dry gas has been shut off with an extra string of casing before drilling into the oil beneath, regardless of the maximum depth of the well.

That 100 per cent of the operators approve and sign an agreement to this effect immediately for the sake of conservation of the field before it is too late.

That an oil and gas association be formed to carry out the provisions of the proposed permanent agreement.

The first of Mr. Tucker's four recommendations was incorporated in the temporary agreement which expires Monday night, November 26. Whether the field is to be saved from wastage of gas by a permanent agreement will be determined at a second general operators' meeting at which the committee of 15 will make recommendations.

Two operators stand ready to seek temporary and later permanent injunctions against the blowing of the wells, especially in the small acreage area in the southeast corner of Section 5, Muskegon Township, if the operators fail to get together by mutual agreement.

Members of the operators committee are: Frank L. Maire, of the Lima Oil Corp.; Oscar Davis, of the Johnson Oil Refining Co.; R. B. Bechtel, of the Dixie Oil Co.; Thomas P. O'Toole, of the Meeke

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Lea County Well Flowing 912 Barrels

Four New Locations Announced. Florence Pool, Colorado, Has 60-Bbl. Completion. Cane Creek Test Near Horizon

By Tolbert R. Ingram
Staff Correspondent, Rocky Mountain Area

DENVER, Colo., Nov. 24.—Preparations for winter drilling are under way at a number of the more important wildcats in the Rocky Mountain area while those in the colder districts where it is difficult to make progress are beginning to shut down. In southeastern New Mexico, where winter conditions are more favorable, four new locations were announced. Three are in Lea County and one in Eddy County. Two new wells commenced spudding. The Midwest Refining Co.'s Hobbs well in Lea County is being tested and averaged better than 700 bbls. a day and subsequently flowed 912 bbls. through a 2-inch line. The Skelly Oil Co.'s No. 1 Joyner is flowing around 50 bbls. by heads after allowing pressure to accumulate.

In Colorado, a 60-bbl. well was completed by the Continental Oil Co. in the Florence-Canon City district, and one well in that area was abandoned. The Continental has shut down its Jackson County operation for the winter and the Producers & Refiners Corp. will endeavor to complete its Pole Mountain test in that county.

In Utah, the Cane Creek test of the Utah Southern Oil Co. appears to be in the horizon in which oil was found in the discovery well, and the Ashley Valley Oil Co. has 2,000,000 feet of gas in the Morrison shale in Uinta County.

In Wyoming, the Wyoming Associated had two completions in Salt Creek, one being a 225-bbl. well in the Sundance, and the other being a 69-bbl. well in the first Wall Creek. The Carter Oil Co. found the Dakota sand dry in its Billy Creek test and is abandoning same.

New Mexico

Four new locations in southeastern New Mexico were announced this week, three in Lea County and one in Eddy County. Two are to be drilled by the Texas Production Co., one by the Texas & Pacific Coal & Oil Co., which is entering that district for the first time, and the other by George F. Getty, Inc. The Texas company's locations are No. 1 E. L. Humphreys, 330 feet each way out of the SW cor., Section 18-20-32, and No. 1 Beulah Lynch, NW NW SW, Section 34-20-34. The last named is 4½ miles south and half a mile east of the same company's No. 1 Jackson abandoned more than a year ago at 4,010 feet, and 7½ miles east and 4 miles south of the Marland's No. 1 Brooks, a drilling well. No. 1 Humphreys is 7 miles west and 1½ miles south of No. 1 Brooks. The Texas & Pacific Coal & Oil Co.'s No. 1 State has been spotted in the SE SE SW, Section 22-23-36, and is 18 miles due north of the Texas company's No. 1 Rhoades, the discovery well in the Jal area, and 1 mile northwest of the Marland's No. 1 Lynn. The footage is 2,310 feet from the north line and 330 feet from the east line of the southwest quarter. The Eddy County location is George F. Getty, Inc.'s No. 1 Bates & Martin, C SE SW, Section 31-20-29, in the Twin Mounds district, 4 miles west and 1½ miles south of the shut-in producers in that district. Two new wells also commenced spudding this week, the Transcontinental Oil Co.'s No. 1 McWhorter, SE SW NW, Section 6-3s-22, La Mora high in De Baca County, and the Empire Gas & Fuel Co.'s No. 1-C State, SW cor., Section 12-21-34, in Lea County, 1¾ miles west and one-half mile south of its No. 1.

Lea County

The Midwest Refining Co.'s No. 1 State, NE cor., Section 9-19-38, on the Hobbs high in Lea County, has been on a production test from a total depth of 4,221 feet. In 24-hour periods beginning October 8, it made 736, 679, 778 and 683 bbls. per day. It was then beaned down to a three-eighths-inch choke and made 440 bbls. It was choked to a one-fourth-inch bean and made 258 and 158 bbls. in successive days. It was then allowed to flow 24 hours through a 2-inch line and made 912 bbls. The Skelly Oil Co.'s No. 1 Joyner, NE cor. SE, Section 26-25-36, is still bottomed at 3,251 feet and is flowing by heads and making about 50 bbls. a day after being shut in from 12 to 24 hours. The 12½-inch casing is being pulled. The Marland Production Co.'s No. 1 Danciger, SW cor., Section 7-23-36, in the Ochoa district, 20 miles north of its Eaves gasser, is drilling ahead without anything of an encouraging nature showing up below the sulphur water which filled the hole at a depth of 3,844 feet. It is now drilling at 3,945 feet. Same company's No. 1 Lynn, NW cor. SE, Section 26-23-36, is bottomed at 3,224 feet and bridging hole at 3,150 feet to run and cement the 6⅝-inch casing. Between the point at which the casing will be set and the bottom it has had several shows of oil and considerable gas, the latter gauging 25,000,000 feet. The Marland's No. 1 Brooks, NW cor. SW, Section 8-20-33, is bottomed at 3,475 feet and is pulling the 6⅝-inch to ream the 8¼-inch down to fish out bit. Same company's No. 1 Warren, SW SW, Section 28-20-38, is fishing for tools at a total depth of 690 feet, and its No. 1 Reed, NE cor. SW, Section 22-20-36, is drilling at 870 feet in the red beds. The same company's No. 1 Lockhart, NW NW, Section 21-21-36, is drilling at 1,380 feet in the red beds, and its No. 1 Slattery, SW cor. NE, Section 7-22-35, is drilling at 3,125 feet in anhydrite. The Marland's No. 1 Meyer, SW cor. NW, Section 26-20-37, is bottomed in the red beds at 1,235 feet and underreaming at 935 feet, and its No. 1 King, NE cor., Section 26-25-32, is shut down at 4,328 feet waiting for orders. It is bottomed in salt. The Marland's No. 1 Eaves, the big gas well in the SW NE, Section 19-26-37, is rotating 50 feet over the top of the tools. Total depth is 3,000 feet. Cranfill & Reynolds' No. 1 State, SE NE, Section 23-26-36, is drilling at 2,930 feet in salt, and the Gypsy Oil Co.'s No. 1 Ramsey, SW cor., Section 34-21-36, is drilling at 3,510 feet. The Midwest Refining Co.'s No. 19 Farnsworth, SW SW, Section 12-26-37, in the Jal area, is cementing the 8¼-inch at 3,792 feet to shut off water. The Maljamar Oil & Gas Co.'s No. 2 Pearsall, NE NE, Section 33-17-32, is underreaming to lower the 12½-inch to 1,092 feet, where it topped the salt. The C. E. Reynolds Drilling Co.'s No. 1 Anderson, C SE, Section 29-13-37, is drilling at 5,235 feet. Hill & Abel's No. 1 Machtel, SW cor., Section 5-26-33, is bottomed at 1,088 feet and running the 12½-inch. The Texas Production Co.'s No. 1 Cagle, NE SW, Section 9-26-37, in the Jal district, is coring at 3,049 feet and below the flow of gas encountered at 2,940 feet. The gas gauged 25,000,000 feet. Same company's No. 1 Moberly, NW SE, Section 17-26-37, is still waiting for drill stem, and its No. 1 Shepherd, SE cor. NE, Section 6-26-37, has recovered tools and has resumed drilling at 2,895 feet.

Eddy County

In Eddy County, Leonard & Levers' No. 1 Haggerty, NE cor. NW, Section 18-16-30, is bottomed at 2,140 feet and underreaming to lower the 8¼-inch to shut off a small quantity of salt water at 2,135 feet. Flynn, Welch & Yates' No. 1 Jackson, C NE, Section 13-17-30, is drilling at 2,540 feet in anhydrite and black sand.

In Chaves County, Snowden & McSweeney's No. 1 Merchant, NW NW, Section 27-15-23, is still shut down at 2,545 feet waiting for orders.

In Torrance County, the Bluhall Oil Co.'s No. 1 Kistler, C NW SW, Section 7-4n-10e, is drilling up bailer at 1,400 feet.

San Juan County

In San Juan County, the Blackrock Oil Co.'s No. 2 Swineburn, SE cor. SW. Section 11-25-13, is drilling at 1,500 feet and carrying the 10-inch. It will continue to the Dakota after failure to find commercial production in the Mesa Verde sands. The Milwaukee-New Mexico Syndicate's No. 1 Beardsley, SW NE, Section 30-28-11, in the Kutz Canon district, is ready to commence spudding. and the Kutz Canon Oil & Gas Co.'s No. 1 Day, SW cor., Section 20-28-10, is drilling at 365 feet. It had a small show of oil at 305 feet. The Dorothy Oil Co.'s No. 2 Goede, NW SE, Section 29-30-9, in the Blanco district, is drilling at 635 feet, and the Iowa Oil Syndicate's No. 1 Viles, SE cor., Section 28-29-11, has shut off water and is drilling at 730 feet. It has cut several thin horizons showing small quantities of oil. The Angel Peak Oil Co.'s No. 1 Garland, NE NE, Section 11-28-11, topped a sand at 1,195 feet making approximately 500,000 feet of gas. The bailer has been recovered and the 12½-inch is being run at 1,200 feet. The Continental Oil Co.'s Pennsylvanian test on the Rattlesnake Dome is still fishing.

Colorado

Colorado had two completions both in the Florence-Canon City Pool in Fremont County. The Continental Oil Co.'s No. 4 Marjo, SW NW, Section 22-20-69, in the south extension of the Florence Pool was completed at 1,800 feet and is making 60 bbls. on the pump. Paul C. Batis & Co.'s No. 1 Mroz, NE SE, Section 4-19-70, in the Canon City district, was abandoned at 2,500 feet.

Cold weather, soft roads and failure of water supplies has retarded a number of wildcats. In Jackson County the Continental Oil Co. has shut down for the winter. Its No. 1 Pollock, SE cor., Section 2-9n-79, on the North McCallum

(Continued on Page 70)

LARGEST WELL IN TURNER VALLEY DOUBLE ROYALITE NO. 4 GUSHER

By Victor Lauriston
Staff Correspondent, Canadian Fields

CHATHAM, Ontario, Nov. 24.—In the Turner Valley Field, Okalta Oils' No. 1, LSD 1, Section 1-20-3w5, which recently blew in as a big gasser in the deep lime at 5,040 feet has been measured by C. W. Dingman, Federal petroleum and natural gas inspector, and is good for 32,000,000 feet open flow. The gas is reported very wet. Following the first wet gas strike, diamond drilling was continued until the tools were safely removed from the hole. For several days the well blew out fragments of rock, some 3 inches in diameter, but the rock is now being replaced by a fine white lime which covers the ground to a depth of several inches. With one separator in operation and no back pressure applied, a daily crude naphtha recovery of around 300 bbls. is reported, but the well is expected to make 1,000 bbls. when fully equipped for production. Two additional separators are now being installed and the company plans to ultimately use six separators. A "Y" pipe line will be attached to the well with three separators on each branch, so one unit can be used while the other is being cleaned.

Analysis of the gas is being made to determine its crude naphtha content. It apparently contains very little sulphur. The crude naphtha tests from 60 Baume up, according to the amount of back pressure applied. The gas flow has fluctuated considerably. The well blew in at 20,000,000 feet, later declined to 15,000,000 and gradually went up to its present volume, 32,000,000. The flow is apparently increasing as the well clears itself. It is the largest well yet drilled in the Turner Valley, the open flow production being nearly double that of Royalite's No. 4 gusher. Negotiations are now in progress for sale of the gas, which, in view of its low sulphur content, may be usable without being run through a scrubbing plant. A 3-inch line is being laid to the Royalite storage tanks to handle the crude naphtha production, which will be taken by the Imperial Oil, Ltd., refinery at Calgary. A 6-inch gas line is being laid to the Royalite plant. The actual crude naphtha recovery cannot be determined until the complete separator equipment is operating under full back pressure, which will be a matter of several weeks. In addition to separators available in the field, two separators of an improved type have been ordered.

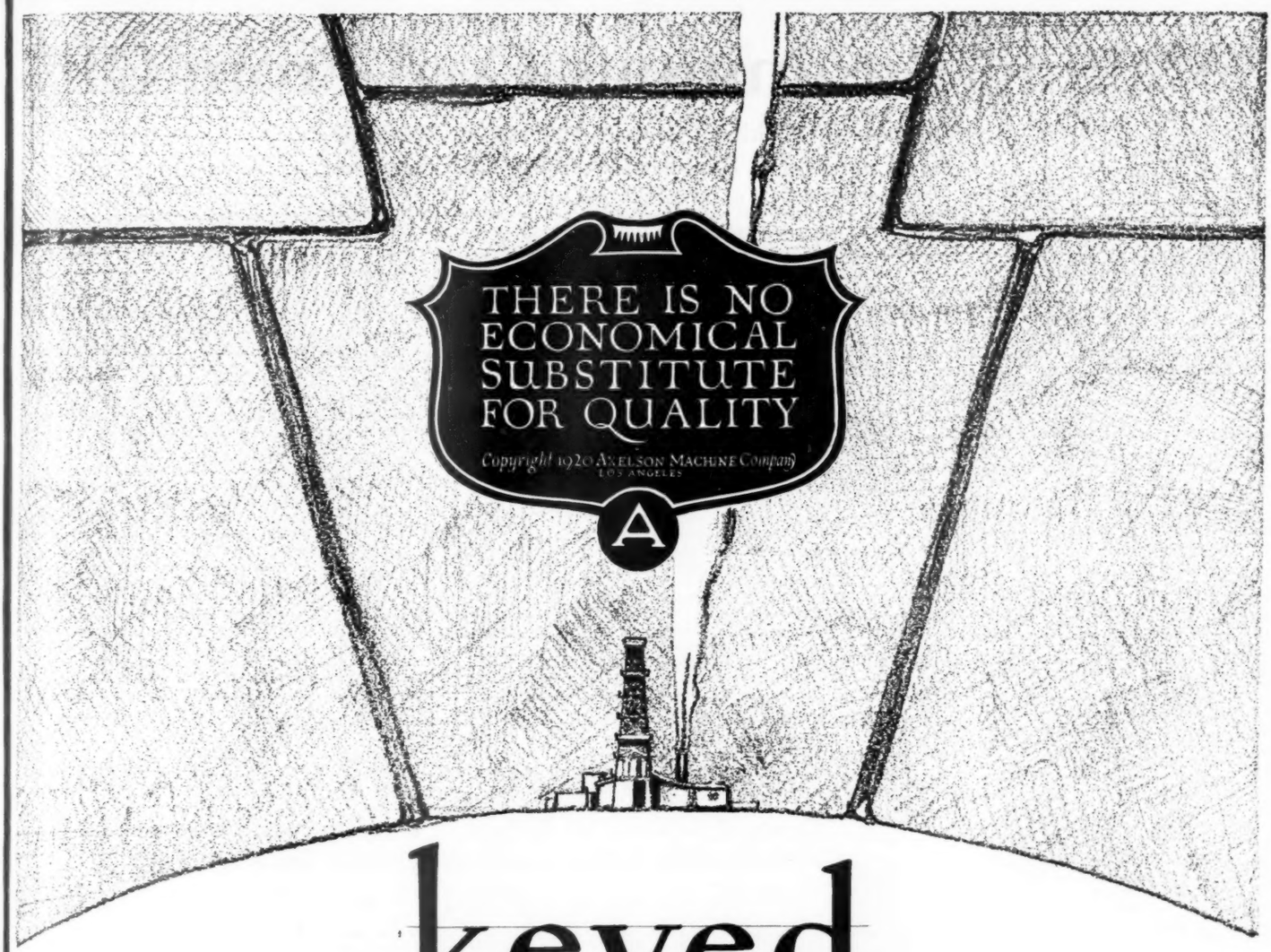
Regent Oil Co.'s No. 1, LSD 16, Section 1-20-3w5, a little south of the McLeod wells, got the top of the lime at 3,745 feet, and is cementing 6¼-inch casing at that depth. Some gas was struck in the top of the lime.

Turner Valley 1929 Program

A. M. McQueen of Toronto, vice president and production manager of Imperial, Oil, Ltd., was in Calgary recently in connection with the development work being carried on by Royalite Oil Co. and other Imperial subsidiaries. Mr. McQueen stated that the drilling program in the Turner Valley Field in 1929 will be at least as extensive as that carried out this year. Whether additional outfits will be put to work in the field will depend somewhat upon the results of wells now being drilled, but there will positively be no diminution of the present activity. With regard to current reports of impending amalgamations between certain independent companies and the Imperial Oil, Ltd., subsidiaries, Mr. McQueen stated nothing definite had been done by his company, though several propositions had been made to officials. The capacity of the present Imperial Oil, Ltd., refinery at Calgary was considered adequate, and no immediate extensions were contemplated.

In connection with operations in the Turner Valley Field, Mr. McQueen stated that the 13 outfits now being operated by Imperial subsidiaries would be kept busy in 1929. When wells are completed, new locations will be ready. Nine rigs are operating on Royalite tests, in

(Continued on Page 142)



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Making Bituminous Coal From Oil

Valuable for Coking Purposes to Produce Metallurgical Coke and as Base for Obtaining Oil From Coal

By Dr. Walter F. Rittman*
Professor and Head Department of Commercial Engineering, Carnegie Institute of Technology

To appear before this conference, largely devoted to the manufacture of petroleum from coal, with the description of a plant manufacturing coal from petroleum requires real courage. It is unlikely the coal industry will be demoralized by competition from the operation. On the contrary, the coal I am about to describe may prove to be an ideal starting material or raw product, either alone or mixed with other coals, for processes of converting coal into petroleum. One important American refinery is planning to provide facilities to convert its crude petroleum entirely into gasoline with the manufacture of some coal as a by-product; with the combination of processes it would by no means be difficult to visualize a plant capable of converting the crude petroleum entirely into gasoline.

Commercially Possible

The first question naturally is: "Is it commercial?" For a period of months the plant has been manufacturing some 25 to 30 tons a day; facilities are now being provided to increase this to 100 tons a day, with plans under way to considerably increase that output; the balance sheet is decidedly in the black, but these statements do not answer why it is commercial. It becomes necessary to describe conditions, more particularly in the Mid-Continent section, pertaining to gasoline production and fuel-oil markets.

It is becoming the practice of oil refiners to handle only such quantities of crude as can be refined efficiently and profitably. Whereas, not many years ago the average production of gasoline from crude was well below 20 per cent, it is by no means unusual today to find refineries converting 75-80 per cent of their crude into gasoline by "cracking" processes. The "skimming plant" no longer can compete with the more complete refinery.

Cost of Refining

Low-grade fuel oil at present in the Middle West is selling for about 1½ cents a gallon and during the past six months quantities have been sold as low as sixty-two-one-hundreths cent a gallon. When, with a manufacturing cost of under 3 cents a gallon, it is possible to convert considerable portions of this fuel oil into gasoline, it at once becomes obvious that the goal of the progressive refiner is to produce a maximum of gasoline and a minimum of fuel oil from a given quantity of crude oil, particularly since he receives for a gallon of fuel oil only a fraction of what he pays for crude. Moreover, other conditions prevailing and developing in the Mid-Continent point strongly to a depressed fuel oil market. Coal is cheap. Despite the cheapness of coal, however, another factor looms big, the long-distance piping of natural gas.

It appears now that in relatively few years a large portion of the Middle West will have available natural gas at prices low enough to offer serious competition to coal, and ruinous to the petroleum refiner having large quantities of fuel oil to sell. In short, the problem of the Middle West petroleum refiner is, and very probably will continue to be, "Make more gasoline and less fuel oil from a given quantity of crude oil," and it is as a by-product of this situation that the manufacture of coal from petroleum refuse is made commercial. The quantity of gasoline required appears to be of constantly increasing proportions. With more than 30,000,000 automobiles the United States in 1929 will produce well in excess of 15,000,000,000 gallons of gasoline, with an annual increase of roughly 10 per cent.

Treating the Fuel Oil

As a by-product of the cracking process at the plant to which I will now refer, there is produced a refuse oil, fuel oil, containing considerable solid matter and considerably heavier than water. In this particular cracking process lime is used in the process, and this lime concentrates in the refuse and constitutes a part of the solids referred to, the balance being free carbon. The problem was to recover the oil present in this refuse at a minimum cost in order to make more gasoline from the recovered oil. A common practice is to charge this refuse to shell stills, called coking stills, put a fire under the still and continue heating until only coke, with a very low volatile matter content remains. This batch procedure requires a big investment in stills; depreciation and maintenance is high, and the coke must be removed manually with a variety of implements. The cost of recovering the oil is real, both with respect to investment as well as labor and maintenance. In the present operation the refuse oil is pumped through a long continuous coil (about 3-inch inside diameter and several thousands of feet long) placed in a furnace, known as a pipe still. The end of this heating coil leads to a chamber, from the top of which the vaporized oil is led to a condenser and recovered, and the "bottoms," while very hot and still in a fluid condition, are pumped to any desired point, and, in fact, have been pumped directly into gondola cars in which shipment was made. By controlling the rate of flow through the coil, as well as the furnace temperature, neither of which is difficult, one can readily control the percentage of volatile matter left in the residue. This percentage of volatile matter left in the residue naturally will be primarily influenced by market and operating conditions. An analysis of a typical residue which congeals into an amorphous bituminous coal follows:

Volatile matter	45%
Fixed carbon	51%
Ash (lime)	4%

Practically Continuous

The operation appears to be practically continuous, in that runs of two to three weeks' duration have been common. With manual labor of practically negligible proportions, since no manhandling is involved; with low investment cost compared with coke stills; and with relatively low maintenance cost, it becomes apparent why the operation is commercial. One could almost afford to give away the coal. However, this is by no means necessary. Large-scale tests are under way, and it already appears that this coal is most desirable for coking purposes to produce metallurgical coke. The reasons for this are apparent when one considers the character and low percentage of ash, together with the fact that coal is very low in sulphur.

In addition, large-scale experiments are under way wherein the material is being pulverized before burning; also a large boiler is being equipped with a type of rotary burner used in oil refineries. Also I feel that this material might be an admirable raw product for the processes which propose to convert bituminous coal into petroleum, which petroleum in turn could by present methods be converted entirely into gasoline with small quantities of more coal, thereby bringing to reality the desire of progressive petroleum technologists; i.e., to convert crude petroleum entirely into gasoline.

*Delivered before the second International Conference on Bituminous Coal, Pittsburgh, Pa., November 19-24.

Unit Operation in Rocky Mountains

Contrast Between Its Effects in Wyoming and Diversity of Ownership in Montana Field. Oregon Basin Situation

By A. Baker*
The Ohio Oil Co.

The question of overproduction, while not of the same magnitude as in Texas, Oklahoma or California, nevertheless has been just as vital and pressing for solution in the Rocky Mountain region as in these older and more productive and more favorably situated states. The operators in the Rocky Mountain region have, in most instances, shown a disposition to be as diligent and wide awake in their efforts to remedy overproduction as the operators in these other older states, and a gratifying start and progress has been made, especially in the State of Wyoming.

In the Grass Creek Field in Wyoming a partly government and partly privately owned field, which came in in 1913, the two main operators, the Midwest Refining and the Ohio companies, from the beginning sensed the dangers of too rapid and intensive development, hence we find this field outstanding as an orderly and well regulated field, with operations carried on under a practical unit plan, careful at all times to co-ordinate the production with market demand, and using every method possible to maintain a steady production and recover the maximum amount of oil and gas at a figure to return the investment and a profit. The fact that after 15 years, this field is one of the major producing fields of the Rocky Mountain district, bears silent witness to the wisdom and far sightedness of the operators. Doubtless Grass Creek will be producing oil when many other less well regulated fields are gone and forgotten.

In the Rock River, Wyoming, Field, privately owned, which came in in 1918, due to the fact that when the producing area had been determined, it was in the hands of one operator, the Ohio, with one other large company, the Continental, having a substantial interest, it was not difficult to inaugurate a unit plan of operation of the field, which was done. Here again we find a long lived, well regulated field, with everything subordinated to prevention of waste and recovery of the maximum amount of oil from the producing sands. The excellent condition of this field today, after 10 years' operation, speaks for itself.

In the Elk Basin, Wyoming, Field, part government and part privately owned, one of the smaller but important fields, with the productive area controlled by three operators, the field has for some time been handled as a unit, to the decided benefit of all concerned.

Contrast in Montana

In Montana, the so-called Kevin-Sunburst Field, in Toole County, almost entirely a privately owned field with great diversity of ownership and a number of operators, came in in 1922. Within the ensuing three years, the field was the scene of one of the most feverish, unsystematic and intensive drilling programs ever witnessed in the Rocky Mountain region. The result was a production of oil greatly in excess of market demand, which in turn resulted in many operators receiving 60 cents per barrel for their flush production, compared with a present price of $1.65 per barrel. Had it been possible to inaugurate a unit operation of the field five years ago, without doubt it would have resulted in a saving of several million dollars to the producers and an increased life for the field and greater recovery from the productive sands.

In the great Salt Creek Field in Wyoming, a government owned field, after several years of intensive development, resulting from the requirements of the government leases and so many operators in the field, these operators found themselves in 1922 in the unenviable and almost critical position of having a potential production of 200,000 bbls. per day developed, with a market for but 80,000 bbls., or 40 per cent. This resulted in the operators meeting together and selecting a committee of operators and a supervisor to study the situation and work out a method of preventing the great waste and loss that was then threatening. The efforts of the operators were successful and acting through their committee and supervisor, they were able to inaugurate a unit operation and proration of production plan, which took care of the overproduction and prevented great waste and loss. The Salt Creek Field owes much to the wisdom and foresight of the operators who, when disaster threatened, saved the situation by unit operation, resulting in great benefit not only to the operators themselves but to the land owners and royalty holders, the United States and State of Wyoming. The Salt Creek Field stands out as a unit operated and scientifically managed field.

Little Buffalo Basin Plan

In 1926, the operators in the Little Buffalo Basin, Wyoming, gas field, a part government owned and part privately owned field, fortunately consisting of two major companies, the Midwest and the Ohio, found themselves with a gas potential developed production of several hundred million feet per day obtained by the expenditure of probably one-half to three-quarters of a million dollars in drilling a number of wells, with the field removed from a transportation pipe line, which if constructed, would open up a market for but a fraction of the production. Undaunted, these operators tackled the problem. They secured the construction of a transportation gas pipe line connecting the field with such markets as existed, at an expenditure of more than $1,000,000. They also secured the co-operation and consent of the land and royalty owners, including the United States Government, owning a large acreage, and the State of Wyoming, owning two tracts, to the unit plan of operation

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*Before Rocky Mountain Oil and Gas Association, Casper, Wyo.

New Illinois Oil Pool Near St. Louis

Discovery of 25-Bbl. Well at 670 Feet, in St. Clair County, Across the Mississippi River, Interests City

By Whit
Staff Correspondent, Central West Fields

FINDLAY, Ohio, Nov. 26—The Central Ohio Field as usual is the most active division of the Central West fields, although the Muskegon Field of Michigan is gradually coming to the front on account of the good wells found there in both oil and gas.

One of the important finds was in the extreme western section of Illinois, far away from production, on the G. L. Tarlton, Jr., farm, in Sugar Loaf Township, St. Clair County, good for 25 bbls. from a total depth of 701 feet.

Five completions are reported from various areas of the old Lima Field of northwestern Ohio. In the Findlay Field, of Liberty Township, Hancock County, L. Cramer's test, 200 feet from the south line and 600 feet from the east line of the Sol Frey, mapped as the Roferd Codner farm, in the southeast quarter, Section 31, topped the Trenton at 1,327 feet and drilled 60 feet into the sand, to a total depth of 1,385 feet, getting a 15-bbl. pumper, which is considered a fairly good well and means more development in the immediate area if the well holds its production any length of time.

Northeast of Lima, in Bath Township, Allen County, C. A. Peavy, well known Lima operator, drilled a test 300 feet from the south line and 950 feet from west line of C. G. Vore farm, on the oil map as C. E. and Pearl Vore, in the southwest quarter, Section 12, getting a 10-bbl. pumper at a total depth of 1,350 feet. The sand was topped at 1,318 feet and drilled 38 feet into the sand.

Sandusky County

In Sandusky County, Scott Township, J. E. Bowe and others drilled a test 200 feet from the north line and 800 feet from the east line of the J. E. Bowe farm, on the oil map as the E. Brommell farm, in the northeast quarter, Section 14, getting the top of the sand at 1,221 feet and at 10 feet in the sand getting a small gas well that will be used for dwelling house heat. The well is estimated at 5,000 feet.

In the Forest area of Hardin County, in the eastern part of the old Lima Field, on the Lost Dome Field, the Kurtz Gas Co. drilled a second test on the McNutt farm, Section 19, Jackson Township, approximately 1,200 feet south and a little east of the initial discovery well on the same farm, and about 30 feet west of the Eureka Pike, now the Patterson Kelly Pike. In this well there were 23 feet of drive pipe, 265 feet of casing; top of Trenton 1,233 feet; total depth 1,278 feet. It was absolutely a dry hole until given a shot of 60 quarts, making it a commercial producer, with a volume of 100,000 feet of gas. The Ohio Fuel Gas Co.'s gas line is within 50 feet of this well and was connected up at once. The Kurtz Gas Co. has started drilling No. 1 on the Aaron McKinley farm, on the oil map as the Frank McKinley farm, about due south of the No. 1 Kurtz, and east of the Eureka Pike.

In Wyandot County, Jackson Township, and a part of the Lost Dome Field, Cline, Sextline and Clash drilled a dry hole on the George A. Webber farm, Section 34. The Kemrow Co., of Wooster, Ohio, is drilling on the Simon Parcell, being No. 1, and about 2 miles due east from the dry hole on the Webber farm. This well is on the north side of the Parcell Pike.

Central Ohio

Twenty completions were reported from the Central Ohio Field with 2 dry holes, 11 gas wells and 124 bbls. initial production from 7 producers. Work is being maintained throughout 16 counties, where the week's work shows that 36 new wells were started drilling and 18 new locations staked, a total of 54, which is more than many of the fields have in an entire month. No big oil wells were uncovered and few gas wells of any large volume.

In Ashland County, Orange Township, the Logan Gas Co.'s No. 1-3,040 on the W. T. Albertson, Section 11, is a good average size gas producer. Same company is drilling No. 1-3,049 on the Nettie McFadden, Section 2, and made a location for a test on the A. C. Smith, Section 15. In Vermillion Township, H. Church drilled a dry hole in a second test on the Jackson Baker, Section 31, at from 805 to 812 feet. The Ohio Fuel Gas Co. is drilling No. 1-3,320 on the L. C. Galloway, Section 23. The Kemrow Co. is drilling a test on the Mrs. Marion Glass, Section 23. In Orange Township, the Kemrow Co. made a location for No. 3 on the John T. Fluke, Section 15; No. 1 Holland Brubaker, Section 22, and No. 2 on the Emma Miller, Section 11. Same company is drilling No. 2 John T. Fluke, Section 14. In Hanover Township, the Ohio Fuel Gas Co. made a location for No. 2-3,344 on the Albert Fritz, Section 12. In Greene Township, the same company is drilling No. 1-3,309 on the Frank E. Milligan, Section 32, and the Logan Gas Co. made a location for No. 2-3,032 on the John K. Cowan, Section 20. In Perry Township, Curtis and others' No. 5 on the Eliza Devault, Section 20, is a 15-bbl. pumper from the Berea sand.

In Medina County, Hinckley Township, the Ohio Fuel Gas Co.'s No. 1-3,240 on the E. E. Shank, Lot 37, is a 10-bbl. pumper. Hulse & Kundtz are drilling a test on the Barbara Hess, Lot 51. In Liverpool Township, the Preston Oil Co.'s No. 1-1,268 on the William F. Shaffer, Section 16, is showing for a small oil producer.

Lorain County

In Lorain County, Grafton Township, the Ohio Fuel Gas Co.'s No. 1-3,274 on the Frank Lang, Lot 10, is a small gas well. Same company is now drilling No. 1-3,318 on the John Cowley, Lot 20, Eaton Township.

In Wayne County, the Ohio Fuel Gas Co.'s No. 2-3,300 on the George V. Cline, Section 29, is a very fair gas well. F. E. Barnhart and others are at work on a test on the T. G. McCarty, Section 5, and Harmon and George are drilling No. 1 Dr. Biddle, Section 7.

In Holmes County, the East Ohio Gas Co.'s No. 7 J. R. Forgy, Lot 10, produced an initial of 17 bbls. and made a location for No. 4 on the F. M. Newells, Lot 39. In Paint Township, the Ohio Fuel Gas Co.'s No. 1-3,179 on the A. M. Miller, Section 5, showed for a small gas well but declined very rapidly and was abandoned as a dry hole. Same company made a location for a test on the Joseph P. Miller, Section 4. East Ohio Gas Co. is drilling No. 1 L. Neal, Section 15, and made a location for a second test on the G. O. Ledbetter, Section 9, Richland Township. In Killbuck Township, Tatgenhorst and Aggins made a location for a test on the Charles Hanes, Section 23.

In the Cleveland Field, Cuyahoga County, Dillon & McFredrick are drilling No. 3 on the G. Beriwell, Lot 49, Strongville Township.

In Knox County, Brown Township, the Ohio Fuel Gas Co. is drilling No. 1-3,275 on the Retta Switzer, Section 4. East Ohio Gas Co. is drilling a test on the M. J. Strang, Section 20, Jefferson Township. In Jackson Township, the Arkansas Gas & Fuel Co. is drilling No. 5 Frank Rinehart, Section 22, and Jameson Leightner is drilling No. 2 Charles Davidson, Section 21. In Howard Township, Harry Perkins is drilling a test on the James Griffin, Section 13.

Coshocton County

In Coshocton County, Pike Township, the Leonard Oil & Gas Co. is drilling No. 3 on the Isaac Norris, Section 12. Ohio Fuel Gas Co. made a location for a test on the William Dickeysheat, Section 7, Crawford Township, and the Preston Oil Co. made a second location on the R. E. VanWinkle, Section 14, Perry Township.

In Summitt County, Franklin Township, F. A. Brendall and others drilled in a very fair gas well at a test on the Ephram Stump, Section 26. Same firm is drilling a test on the E. A. Raber, same section; also No. 2 on the C. L. Wilcox, same section, and No. 1 on the Levi Stump, Section 22. This firm is running close to 10 strings of tools in the township. East Ohio Gas Co. made a location for a test on the C. H. Braucher, Section 25, also for No. 4 Robert Miller, Section 28, and for No. 2 on the Lloyd Bliler, same section, where they drilled an excellent gas well a few days ago.

In Licking County, Bowling Green Township, the Pure Oil Co. got a 15-bbl. pumper in a test on the James Phillips, Section 15, at from 2,794 to 2,840 feet. This well also produces around 200,000 feet of gas. The Ohio Fuel Gas Co.'s No. 1-3,264 on the Catherine Hupp, Section 14, has been pronounced a dry hole in the Berea sand at from 764 to 779 feet and drilled to a total depth of 780 feet. In Fallsburg Township, the Preston Oil Co. is drilling a second test on the N. E. Norris. In Perry Township, the Preston Oil Co.'s No. 8 James Wright, Section 16, produced 12 bbls. from 716 to 728 feet. Kountz and Shultz are drilling No. 1 Jerry Cullison, Section 2. Settles Oil Co. has a light gas well in No. 4 on the Jacob Lothers, Section 8, at from 803 to 813 feet. Whitehill Gas Co. is drilling Nos. 3 and 6 on the Albert Ashcroft, Section 2, and H. C. Farmer is drilling No. 2 on the Albert Ashcroft, same section. Ohio Fuel Gas Co. made a location for a test on the Flora E. Fulk, Section 4, Hopewell Township.

In Muskingum County, Perry Township, the test of the Mid-East Oil Co., on the William Knight, Section 15, struck the top of the Clinton sand at 4,003 feet and drilled to a depth of 4,030 feet, and reported making a very good oil showing, and was reported around 200 bbls., but this has not been confirmed. In Jackson Township, the Pure Oil Co. is drilling No. 3 on the John Hoover, Section 6. In Hopewell Township, the Whitehill Gas Co.'s No. 3 J. C. Francis, Section 6, is reported good for 50 bbls. at from 3,156 to 3,205 feet.

Athens County

In Athens County, Ames Township, Kiggins and others have a light gas well in No. 3 on the O. D. Jones, Section 2. The gas was found in the second Berea sand from 1,518 to 1,538 feet and drilled to a total depth of 1,540 feet. Same firm is drilling a test on the Amos Limscott, Section 3. Fox & Mosure's test on the F. E. Phillips, Section 13, is an average gas well, in the second Berea at from 1,303 to 1,327 feet and total depth 1,328 feet. Orondorff and others are drilling a test on the Myrtle Green, Section 2. In Carthage Township, the Ohio Fuel Gas Co. has an average gas well at No. 1-3,228 on the Arthur A. Cole, Section 4, in the Salt sand at from 1,016 to 1,061 feet. Logan Gas Co. is drilling No. 2-3,053 on the C. C. Snodgrass, Section 31. In Berne Township, the Ohio Fuel Gas Co. has a good gasser in No. 2-3,244 on the E. C. Glass, Section 30, also in the lower Berea at from 1,654 to 1,673 feet, total depth 1,687 feet. Same company's No. 1-3,327 on the J. E. Gilchrist, Section 29, has an average gas producer in the lower Berea at from 1,350 to 1,371 feet, total depth 1,375 feet, and drilling No. 5-3,346 on the Charles E. Elliott, Section 29. Same company is drilling No. 2-3,315 on the State of Ohio Land, Section 16, Lodi Township.

In Meigs County, Sutton Township, the Ohio Fuel Gas Co.'s No. 4-2,460 on Ohio State land, is a 5-bbl. producer from the upper Berea at from 1,668½ to 1,685½ feet, total depth 1,688½ feet. Tyree and others are drilling No. 6 H. D. Carnahan, Section 11, and No. 1 M. Ebersback Co.'s land, Section 13. The Pure Oil Co. is drilling No. 3 David Holter, Section 20. In Bedford Township, the Logan Gas Co. has a fair gas well at No. 1-3,033 on the Russell A. Guskler, Section 33, from the lower Berea at from 1,668 to 1,682 feet, total depth 1,687 feet.

In Jackson County, the Ohio Fuel Gas Co. has a nice gas well in No. 2-3,273 on the Ida E. Jones, Section 23, in the Clinton sand at from 2,643 to 2,655 feet, and drilling No. 3-3,310 on the James McClure, Section 27. Same company is drilling No. 1-3,284 on the Jeff J. Buckley, Section 26, Lick Township, and made a location for No. 2-3,378 on the Lucretia Pugh, Section 34, Coal Township.

In Vinton County, Knox Township, the Co-operative Oil Co. is drilling No. 9 William Bickley, Section 3, and in Brown Township, the Atha Drilling Co. is starting a test on the Carbondale Oil Co.'s property, Section 6.

Guernsey County

In Guernsey County, Valley Township, the Buffalo Gas Co. is drilling a test on the John Verb, Section 4, and the Ohio Fuel Gas Co. is drilling No. 6-3,357 on the Cambridge Colliers Co., Section 3. In Wheeling Township, the Logan Gas Co. made a location for No. 1-3,055 on the W. J. Alloway, Section 10. Preston Oil Co. made a location for No. 7 San M. Henderson, Section 2, and Blackstone and others made a location for No. 3 on the J. O. Alloway, Section 10.

In Morgan County only one completion was reported, and that was in Marion Township, by Rev. David Lang and others in a test on the W. M. Hilaman, Section 18. This well showed 150,000 feet of gas from the lower Berea sand from 1,400 to 1,418 feet, total depth 1,423 feet. Ohio Fuel Gas Co. is drilling No. 1-3,248 on the George Carr, Section 24. Bauman and others are drilling No. 8 on the Florence Shuster, Section 18. Burns Oil & Gas Co. is drilling No. 13 Esther K. Woolman, Section 34. The Kemrow Co. is drilling a test on the Elsworth Mosier, Section 23, also drilling No. 4 Charles Hoffman, Section 29. In Penn Township, Dover Oil Co. made a location for No. 16 on the George B. Dougan, Section 35. Bauman and others are drilling No. 27 J. P. and C. E. Hilaman, Section 15. Ohio Fuel Gas Co. made locations for No. 1 Shirley Jones, Section 3, and No. 1 James Herkitt, Section 2. Bauman and others' No. 1 T. S.

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Natural Gas Developments

Supreme Court Holds State Cannot Refuse Carbon Black Permit

SHREVEPORT, La., Nov. 24.—The United States Supreme Court has ruled that Louisiana, through its conservation department, cannot legally refuse to issue a permit for construction and operation of carbon plants anywhere in the State. The opinion was issued Monday in passing on an appeal of what has become known as the Herkness case. J. Smylie Herkness, of Pennsylvania, had applied for and been refused a permit for a carbon plant in the Monroe gas field but went ahead and built it nevertheless to test the validity of that phase of the State's conservation laws. The effect of the court's opinion is to let down the bars heretofore raised against further development of the natural gas carbon black industry in Louisiana, but that it will be followed by any immediate expansion of any degree in either the Monroe or Richland Parish gas fields is decidedly doubtful.

Instead of a tendency toward expansion in Louisiana, the trend is quite in the opposite direction. Even before the amendment to the severance tax law was adopted by the legislature this summer adding a tax on carbon black and a tax on gas consumed for carbon black manufacture, numerous manufacturers in the Monroe Field had dismantled some of their burning houses and, in instances their entire plants, and moved them to West Texas fields.

When the present policy of the Louisiana conservation department with respect to conservation of gas and restriction of consumption for carbon black was adopted three or four years ago with the advent of Dr. V. K. Irion as commissioner, it was announced that no more permits for carbon plants within the State would be issued, and that the permissible withdrawal or pull on any one well for any purpose would be reduced semiannually according to volume and pressure tests shown at each semiannual regauge. This policy has been consistently adhered to and has resulted in a prolongation of the Monroe Field beyond the estimates of the Bell & Cattell Survey and report of 1921 (Bulletin 9 La. Cons. com., H. W. Bell and R. A. Cattell, petroleum engineers, U.S.G.S., July, 1921). No permits for plants in the Monroe Field have been issued since that time, nor have any been issued for plants in the Richland Field. As it is construed by departmental authorities in advance of a copy of the opinion, however, the ruling means that where there is no other outlet or market for one or more gas wells, the department cannot legally refuse permit for a carbon plant.

On the other hand, they point out, the ruling makes no reference to continued tightening of restrictions on the pull on any one or number of wells and therein the department sees a loophole whereby it may comply with the court's order and still conserve the State's gas resources. It may do one of two things or both. It may make no further reductions in permissible withdrawal of gas and still grant additional carbon plant permits, the effect of which would be to reduce the amount of gas each manufacturer in the field, or the State, may consume in his burning houses; or it may continue its policy of semiannual reductions in permissible consumption, which would still further reduce the amount of gas each manufacturer may burn in proportion to the number of new plants in operation.

But, for the reasons stated, any considerable demand for permits for new plants is not anticipated and the immediate effect of the Supreme Court's decision will be of very little effect on the industry in Louisiana or on the State's gas reserves.

NEW SCHEDULE OF RATES FOR MUSKEGON SUPPLY

MUSKEGON, Mich., Nov. 24.—A proposed new schedule of gas rates, including a special scale for commercial and factory heating and providing reductions in the present heating and industrial scales, has been filed with the Muskegon city commission by the Muskegon Traction & Lighting Co. The company has been serving the domestic consumers of Muskegon and Muskegon Heights since September 4. No reduction is proposed in the new schedule for general domestic purposes.

The rate proposed for schools, hotels, downtown office buildings and stores where natural gas can be used at a saving in heating boilers, ranges from 35 cents down to 25 cents per 1,000 feet.

The industrial rate in the new schedule averages 15 cents lower than the original scale announced two months ago. The new rate range is from 45 cents to 30 cents per 1,000 feet of gas. Monthly sales of the company, which formerly furnished Greater Muskegon with manufactured gas, are now running about 18,000,000 feet compared with 39,000,000 feet for August, before the changeover. The new schedule, if approved by the city commission and the Michigan Public Utilities Commission, is expected to add about 15,000,000 feet of gas a month to the present business of the company.

R. L. Pattinson, of Chatham, Ontario, Canada, is president of the new Muskegon Pipe Line Co., organized to supply gas to the Central Paper Co. and Balke-Collender Co. R. H. Owen, also of Chatham, is vice president and treasurer. J. V. Howard, also of Chatham, is secretary. H. D. Eliason, vice president and general manager of the Central Paper Co. As soon as they receive permission from the city commission to lay their line, the work will be started. The two plants will use about 6,000,000 to 7,000,000 feet of gas a day.

LONE STAR GAS CORP.

Lone Star Gas Corp. is beginning to secure benefits of expansion in 1927 and early this year. Net has been running ahead of last year and colder weather has been stimulating gas demand. Annual report for 1928, the Wall Street Journal says, is expected to show a large increase over $3,829,901 net, equivalent to $3.48 a share on 1,099,324 $25 par shares, reported for 1927.

Last year the company acquired a number of distributing properties and increased its load by extending lines to communities. Natural gas is supplied to Dallas, Fort Worth and 152 other cities and towns in Texas, and to several in Oklahoma. During 1927 meters increased 37,903 to 196,601. Of the increase, 12,447 were acquired by purchases and 25,456 added by growth and construction. Increase this year has not been as large, but many have been added by extension of lines.

Property account increased $35,170,933 in 1927, of which $22,172,077 represented acquired properties and $12,998,856 extensions. Funds for these additions were secured through sale of $15,000,000 of 5 per cent debentures, and $7,200,000 short-term notes. Reserves and earnings supplied $6,977,099.

Production and distribution of natural gas secure major portion of revenue, but it also has a small production of crude oil and a fairly large yield of gasoline.

Natural Gas Meeting To Be in Shreveport On January 14 and 15

SHREVEPORT, La., Nov. 24.—The southwestern division of the American Gas Association's Natural Gas Department will hold its annual convention here January 14 and 15, it has been announced by Henry C. Morris, president of the Dallas Gas Co., and vice chairman of the Natural Gas Department.

The program for the two-day session is being outlined by Elmer Schmidt, of the Lone Star Gas Co., of Dallas, assisted by Mr. Morris and N. C. McGowen of Shreveport, former president of the Natural Gas Department. Mr. McGowen is now a member of the advisory committee and is directing preparations for the reception of the delegates, assisted by other Shreveport and Louisiana gas men.

A number of addresses are included on the tentative program, several of which will be of highly technical importance. The subjects will include: "Open Flow by Pressure Methods," "Proper Casing of Wells," "Maximum Economic Pressure Limits for Which Long Distance Lines Can Be Designed," Ideal Distribution System for Communities of 250 to 1,500 Meters," "Proper Classification of Accounts for Natural Gas Producing Pipe Line and Distributing Companies," "Gas Company Advertising," and "Domestic Advantages of Natural Gas."

Besides these, an attempt will be made to arrange for an address on gas developments and several companies will be asked to suggest additional papers. The paper on "Domestic Advantages of Natural Gas," will be given by a woman familiar with the subject who will treat the matter from the standpoint of the woman in the household. The paper on "Gas Company Advertising," probably will be handled by Miss Lois Upshaw, advertising manager of the Dallas Gas Co. It is likely that a member of the Louisiana Public Service Commission will participate in the program.

A trip to some of the gas fields near Shreveport may be arranged. Monday night, January 14, delegates will be guests at an entertainment arranged by the companies acting as hosts. Preparations for attendance of the southwestern division at the annual convention of the Natural Gas Department next spring in Kansas City will also come up for discussion.

LAY RIVER CROSSING LINE WITH NO RIVER

HOUSTON, Tex., Nov. 24.—Pipe-line companies frequently lay lines across rivers, but laying a river crossing where there is no river is a novelty just completed by the Houston Pipe Line Co. on its gas-line loop by way of Freeport to Houston.

Although there is no river there now, there will be, and the Houston Pipe Line Co. figured it might as well be there first and thus save some inconvenience and interruption of service later.

The riverless river crossing has been made at a point on the right of way of the channel which the Government is dredging to divert the course of the Brazos River through southern Brazoria County to a new route to the Gulf of Mexico. At present the Brazos River flows by way of Freeport, but as the sand deposits of the river at its mouth long have been an obstacle in way of making a good deep-water harbor at Freeport, the Government has undertaken to divert the river to the west from Freeport from a point some distance above that town.

The change in the course of the river required the Houston Pipe Line Co. to lay another river crossing where the new river will be, and now when the government channel is completed the company's crossing will already have been in operation and the old Brazos River crossing will be left high and dry.

Although it might be supposed that the laying of this crossing before the river is cut through would be simple, in this case the company had to face some difficult obstacles, and also in laying the line had to deal with an unknown factor of the river's erosion of freshly made banks and channel which might cause sagging and breaking of the line.

Four 8-inch lines were laid at the river crossing, stretching a distance of 2,000 feet between the two levees thrown up on either side of where the river is to be, and to put these lines below the bottom of the channel and out of the way of the government dredges, the Houston Pipe Line Co. had to excavate a ditch more than 25 feet deep the distance of 2,000 feet.

The bottom of the channel the Government is dredging is to be 12 feet below the mean low-tide level, and the pipeline crossing is laid 18 to 20 feet below the mean low tide, or more than 6 feet below what is to be bottom of the new channel.

The excavating required the lifting of millions of tons of dirt, and as that country is only 6 feet above sea level and in a swamp, and much of the time completely under water, most of the dirt moved was swamp muck and very difficult to handle and to work in. As the swamp water drained into the excavated ditch, the lines had to be laid through water. The excavated dirt was thrown up at either end of the ditch to serve as levees, and what was not used for this purpose was filled back into the ditch after the lines were put in place and tested.

To allow for any sinking or shifting of the lines due to the river washing away its new banks and bottom, each of the four lines was laid with an expansion sleeve at each end. These will permit the lengthening of the lines in the event the banks widen and the bottom lowers, letting the pipe settle.

Each of the four river-crossing lines is provided with two gate valves, one at each end. These gate valves are set up out of the large concrete boxes built right in and under the levees thrown up on each side of where the river is to be and through which boxes the lines pass. The concrete boxes have been built as a protection against washing out of the gate valves which have been provided in the event of a break in the lines.

Laying of this river crossing has been in charge of Frank Kirk, superintendent of pipe lines for the company.

TURNER VALLEY GAS LINE LAID

CHATHAM, Ontario, Nov. 24. — The new 14-inch pipe line of the Canadian Western Natural Gas, Light, Heat & Power Co. connecting the Turner Valley with the main line at DeWinton has been completed, and is being tested.

GAS FOR MISSOURI TOWNS

Pierce City and Marionville, Mo., have granted gas franchises to the Gas Service Co. Negotiations for natural gas service are under way at Monett, Mount Vernon and Aurora, Mo.

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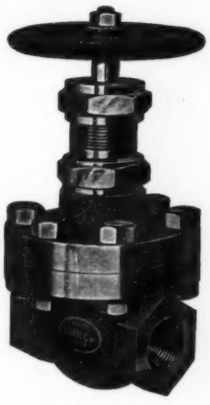


LUDLOW VALVES

CATALOG ON REQUEST

EQUIPMENT AND SUPPLIES

NUGENT PUTS OUT NEW PORTABLE OIL FILTER

A recent addition to the line of oil-filtering equipment put out by William W. Nugent & Co., Chicago, is the port-

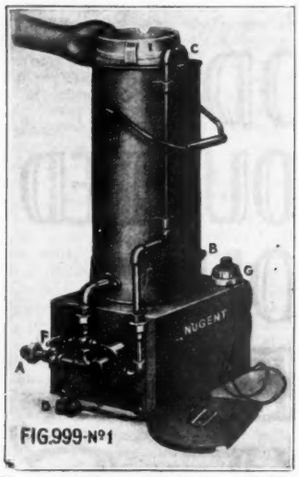


Figure 1—Assembled view of filter without stand.

able motor-driven filter with a capacity of 6 gallons per hour, illustrated.

The new filter is especially adapted for filtering the oil from any inclosed type of machine, such as reduction gears, engine crankcases and similar equipment. A flexible-hose suction pipe furnished with the filter is run from the pump connection A on the filter to the drain of the oil chamber on the machine, and the clean oil discharge B, is carried back to the machine. In this way the oil can be filtered while the machine is in operation.

The filtering medium consists of three filtering bags, shown assembled and disassembled in Figure 2. The inside bag is made of medium-weight muslin, the

Figure 2—Filter bags.

center and outside bags are of material of special texture and thickness. Each bag is attached to its respective ring so that it can be readily washed without removing it from the ring. The motor for driving the pump C is inclosed within the base of the filter, and the discharge pipe D is so arranged that the filtering bags can be removed for washing or exchanging for a new set without disturbing any piping, as indicated in Figure 1, which shows a filtering bag being removed. By closing the valve E and opening the valve F, the oil may be refiltered as many times as desired.

The unit can be supplied with a light angle-iron stand 31 inches high, if desired. This stand is used to elevate the filter, to make it more convenient and to facilitate the flow of oil back to the machine.

The base of the machine is 9½ by 13½ inches, over all, and the total height without stand is 24 inches, and with it, 55 inches. A flexible steel suction hose three-eighths inch in diameter and 6½ feet long, and a discharge hose one-half inch in diameter and 3½ feet long, are furnished with the filter. The weight of the filter and motor complete is 35 pounds.

TRADE LITERATURE RECEIVED

A 28-page bulletin on Worthington equipment for buildings is being distributed by the Worthington Pump & Machinery Co., New York. It includes pumps for ventilating and heating systems, for elevator and other uses; also compressors, cold-water meters, oil meters and condensation meters.

Under the heading, "A Hills-McCanna Lubricator for Every Need," many lubricating devices are illustrated in a four-page bulletin issued by the Hills-McCanna Co., Chicago.

Tables giving representative physical properties of annealed and heat-treated Sivyer steels are presented in the November number of "Sivyer Reports," published by the Sivyer Steel Casting Co., Milwaukee, Wis.

Catalog No. 1, distributed by the Wieman-Kammerer-Wright Co., Inc., Hollydale, Calif., is devoted to descriptions and illustrations of the W-K-W drilling bit.

The Westco-Chippewa Pump Co., Davenport, Iowa, is sending out a bulletin on "Westco Pumps in Oil Refineries."

Savings effected by installation of the De Laval crankcase oil reclaiming outfit are the subject of an interesting article in the current issue of the De Laval Centrifugal Review, published by the De Laval Separator Co., New York and Chicago.

The Oklahoma Rig & Supply Co., Muskogee, Okla., is mailing a price list of its line of oil field equipment.

Articles of interest to oil men fill the current number of the Rig and Reel Magazine, published by the Parkersburg Rig & Reel Co., Parkersburg, W. Va.

BUSINESS NOTES

The Griscom-Russell Co., New York, which manufactures heat transfer apparatus, has opened a branch office in Memphis, Tenn., making a total of 25 branch offices in the United States.

The Wagner Electric Corp., St. Louis, Mo., has removed its Los Angeles branch office and service station at 1220 South Hope Street. The change involves all local departments—motor, transformer and fan, the service station and the Lockheed hydraulic automobile brake department.

WIDER SURFACE GIVES LONGER LIFE TO BELT

Savings in the wear and life of belts and in shutdown time are being obtained through the use of the 24-inch faced all-steel Ideco bandwheels, manufactured by the International Derrick & Equipment Co. The wide face permits the use of a 22-inch belt with an increase in belt surface area of 67 per cent on the bandwheel.

Through the use of the wider bandwheel, wider and thinner belts can be used, reducing internal belt stresses. The additional bearing surface of the bandwheel reduces the initial belt tension required to eliminate belt slippage, with the resultant savings in shutdowns due to belt failures.

Ideco 24-inch faced all-steel bandwheels are built with eight channel spokes double-riveted throughout. The face is made of a single piece of steel rolled with a welded ground joint. The Ideco deep "V" tug is standard. Hubs are designed for use with A.P.I. shafts.

CABLE CUTTER SAVES MUCH TIME AND WORK

The cutting of steel cable has been a tedious and sometimes dangerous operation, resulting in frayed ends, injured hands and wasted time, while idle equipment lay waiting for repairs. The Starrett steel band and cable cutter, operated by one man, binds and cuts cable of any size up to 1 inch in less than a minute. A thin sheet of pliable but tough steel, indented with a groove and lock seam at one end, is bent around the cable and locked in 20 seconds. The

section of the cable enclosed by the band is then placed in the cable cutter and quickly severed by striking with a sledge, leaving the seizing or whips on both cut ends. The cut ends may be passed immediately through any fitting or fixture with which it is intended to be used. The patented blade and die of the Starrett cable cutter prevents flattening of the cable in cutting and retains the lay of the strands and the natural shape of the cable. The band cinches the lay of the strands in their proper position and prevents unraveling.

The device is made by the Morse-Starrett Products Co., Oakland, Calif.

NEW BELT CONVEYOR IDLER

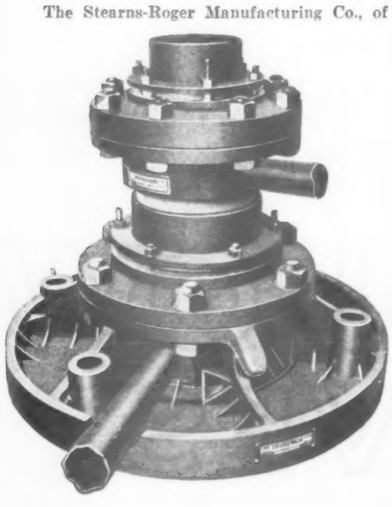
The Chicago Automatic Conveyor Co., Cicero, Ill., announces a new belt conveyor idler. The pulleys are spaced a quarter-inch apart to avoid belt creasing. Heavy steel tubing is used for the pulleys. They have steel heads which are electrically welded flush with the ends, to eliminate dust pockets. A unit mounting is used for the bearings to keep them in proper alignment. The mounting serves also as a grease reservoir. Because of the large reservoir it is asserted that the idlers will run 3 to 6 months without attention.

COMPANY CHANGES NAME

The Power Plant Equipment Co., Kansas City, Mo., announces discontinuance of its old company name. In the future it will be known as the Marley Co. There will be no change in personnel. The new name was adopted because it associates the company more closely with the Marley products which it makes.

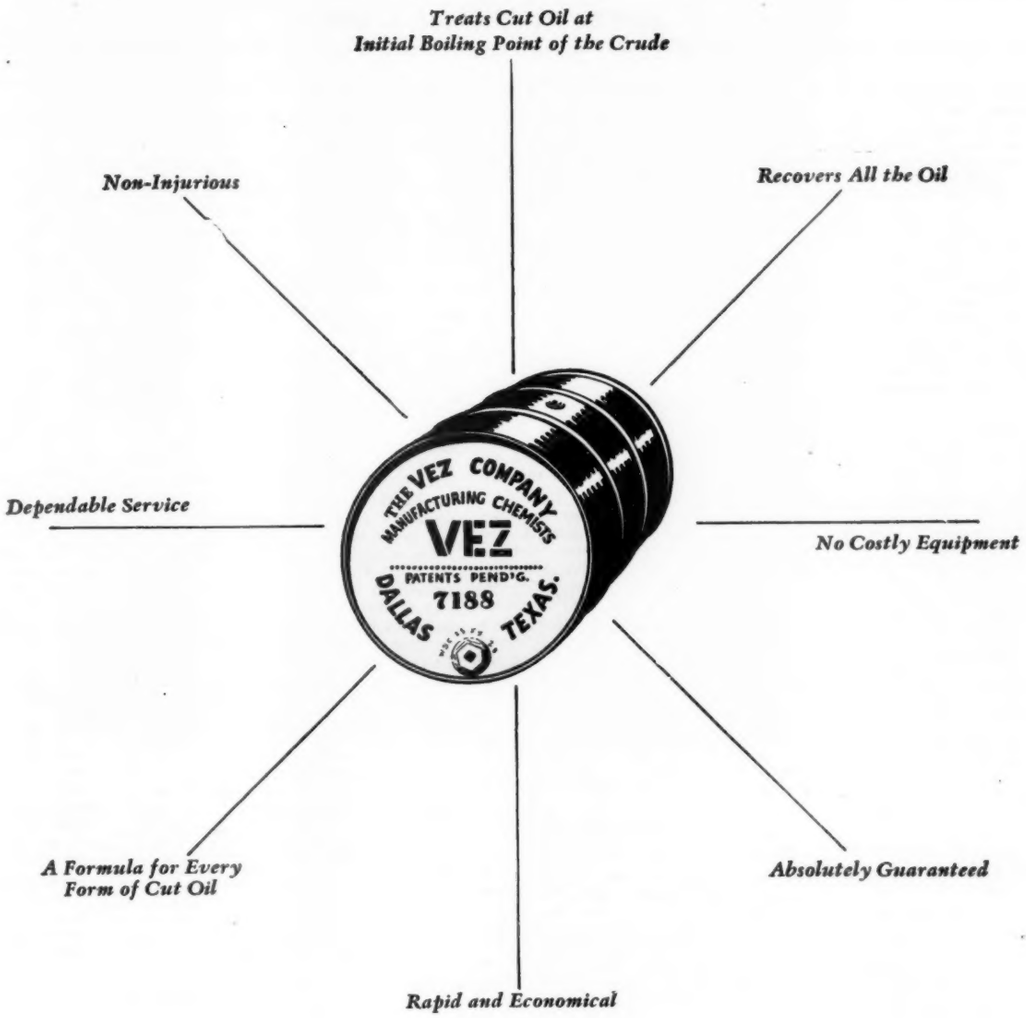
STEARNS-ROGER NOW MARKETING CONTROL HEAD

The Stearns-Roger Manufacturing Co., of Denver, Colo., is manufacturing and marketing a casing suspension control head that is said to have features of value. Lew D. Hilton, veteran oil field superintendent, has been retained by the Stearns-Roger company as sales engineer. The control head will be manufactured in the company's shops in Denver, and distributed in the Mid-Continent through the Longhart Supply Co., with Mr. Hilton and others giving field service.



The construction of these control heads, according to the manufacturers, is such that 99 per cent of the volume is taken care of by means of the supporting device which leaves but 1 per cent of volume exposed to the packing means.

Since entering the oil field several years ago Stearns-Roger have become large manufacturers of oil field equipment and specialties, shipping to the various oil fields of the world. One of the latest developments of this company is the suspension control head.



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Field Problems and Their Solution

EDITED BY THOMAS F. SMILEY

In order that men connected with the drilling, producing and transporting branches of the petroleum industry may procure quickly a solution of many problems confronting them from time to time in their work, The Oil and Gas Journal has arranged with leading engineers and other recognized authorities to answer questions submitted by readers of this publication pertaining to the work of drilling and producing crude oil and transporting this product.

Everyone is invited to submit questions freely. These questions will be submitted to proper authorities by Mr. Smiley, who edits the page, and answers, based on the best available information, will be published. Each question should give as much detail as possible, especially where it relates to matters where depths of sands, types of sands and operations on adjoining properties would have a bearing on the problem involved. The source of all questions will be considered as confidential and only initials will be published in connection with the question.

In this connection, The Oil and Gas Journal will be glad to publish articles from field men who have devised new methods or practices which are improvements.

In case an immediate answer is important, one will be given by mail if the writer requests it.

QUESTIONS IN REPRESSURING

We are producing from the Bartlesville sand at a depth of 1,200 feet. The sand has a total thickness of from 80 to 90 feet, but is broken by layers of sandy shale and porous and tight sand with one layer of sandy material that is both porous and barren. We have two pays, one near the top and the other near the bottom of the sand. These pays are separated by a porous but barren layer.

Can we repressure such a sand successfully? How can we keep the gas or air that we inject into the key wells from spreading indefinitely through the porous barren layer?

Can you tell me of any successful repressuring operations in Oklahoma where the producing sand is 1,200 feet deep or deeper?—R. R. C.

It would be hazardous even to guess whether or not you can repressure successfully under the conditions you describe. To pass valid judgment upon your problem would require a field examination by a capable engineer. Other companies are having success i. repressuring sands at depths of 1,200 feet or more in Oklahoma, but the conditions outlined in your question may interfere with the success of a repressuring project in this case.

If the dry streak between the upper and lower pays has been shot, or if for any other reason this streak does not have a good wall in which to set a packer, there appears to be no way to keep the gas or air from escaping through this porous material.

If it is impossible to pack off this barren sand in the present wells, the next best thing would be to drill new pressure wells, set casing on top of the upper pay, set tubing with packer at top of bottom pay and then mud or cement off the barren porous streak up to the bottom of the upper pay.

GAS INCREASE DOUBTFUL

A gas well 850 feet deep is producing 1,000,000 cubic feet per day by open flow Pitot tube test. The well has a closed-in pressure of 90 pounds. How much more gas could one expect had the casing been 6⅝-inch?—J. G. F.

It is doubtful if this well would have made much more gas through a 6⅝-inch casing than it does through the 3-inch because of the low, closed-in pressure.

From gas tables it appears that if the same Pitot tube measurements were obtained on the well with 3-inch casing and with 6⅝-inch casing, then the well would produce over 4,000,000 cubic feet of gas through the 6⅝-inch casing. But in the problem that you present, the Pitot tube measurements would differ so that no such increase could be expected through the 6⅝-inch casing.

Co-operative experiments by the Corporation Commission of Oklahoma, the United States Bureau of Mines, and the gas companies have shown that wells having open-flow capacities of 3,500,000 cubic feet or less would yield the same open flows through 3, 4, 6 and 8½-inch nipples at the tops of gas wells equipped with 8-inch casing. That is, changing the sizes of the nipples within the stated range did not change the open flow for these small wells. This does not apply directly to your problem, but it suggests that there would not be any great difference in the open-flow capacity of the well with either 3-inch or 6⅝-inch casing.

WOOD AS ACID-RESISTANT

Here's a question that has arisen in my mind and I haven't been able to find anybody around here who can give a straight-out yes or no answer. Maybe you can. Now in the battery that is used in automobiles the partitions between the cells are made of wood. I am told this is cypress or redwood. Now if there is any kind of wood that will resist the sulphuric acid that is put into those batteries, why won't that same wood resist corrosion in West Texas, where they are having so much trouble? And why can't the oil tanks in that region, or any other region where the corrosion is a serious problem, be made out of this wood? I may be all wet as they say, but I'd like to know why my idea is wrong, if it is wrong.—T. L. T.

Yes, wooden tanks will resist the corrosion that you speak of. They have been used in the oil fields from the time the first wells were drilled in Pennsylvania, and are especially useful where steel tanks suffer serious corrosion.

Wooden tanks, however, have several serious disadvantages when compared with modern steel tanks. They cannot be made as large as steel tanks and in the effort to reduce evaporation losses they cannot be closed as tightly at the top. They are also more difficult to move from one place to another as field emergencies may require. Small steel tanks may be transported on trucks with comparative ease, whereas this is difficult with wooden tanks. Wooden tanks are comparatively bulky to transport and are less convenient than bolted steel tanks in setting up.

Small wooden tanks are especially useful as separating tanks at wells making corrosive water with the oil, but they cannot be used to replace the large capacity steel tanks.

Many companies are now using wooden roofs on steel tanks to overcome the serious corrosion of tank roofs by hydrogen sulphide gas. This is reported to be giving highly satisfactory results.

RAIN WATER BEST SOLVENT

What is the quickest solvent of salt? Where the siphon or tubing in a gas well making salt water "freezes up," would you suggest kerosene, pentane, fresh water hot or cold, or other liquid? How long should it remain in well?—T. F. C.

Rain water is the quickest and best solvent for salt. One of the most successful methods of removing salt from gas wells is to introduce 1 or 2 bbls. of rain water into the well through a lubricator. The lubricator is made of a piece of casing of the desired size and length equipped with swage nipples and valves at both ends. This device is attached vertically onto the tubing at the top of the well. The lower valve of the lubricator is closed, the upper valve opened, and the device is filled with rain water. Then the upper valve is closed and the lower valve opened so the water drops down the well. The water is usually allowed to remain in the well for an hour or two and is then blown off. Some operators have used pumps to remove the water, but trouble has been experienced from the pump valves salting up.

Operators using this method generally keep several barrels of rain water on hand and haul it to the wells as required. Rain water is better than creek water or shallow well water because it is comparatively free from dissolved solids that may precipitate out and make the trouble worse rather than better.

Kerosene and pentane are believed to be of no value whatever as solvents of salt. Hot water does dissolve salt more quickly than cold water, but it is believed that no particular advantage can be derived from introducing hot water to remove salt from a well because the water cools so fast.

POSSIBLE BUT NOT PRACTICAL

I note that on page 36 of your November 8 issue is a description of a flowing device for flowing small oil wells.

Now I have several small oil wells that make about one-fourth barrel per day pumping, very little water. The depth is about 400 feet. I was wondering if these wells could be flowed with air or natural gas without the automatic devices attached, by using the trap, 2-inch tubing, flow string, etc., as described in Figure 1 of the article referred to.

Is it necessary to use automatic control as described in Figure 2 of the article?—O. O. C.

It is possible to flow small oil wells by the method outlined in The Oil and Gas Journal of November 8 without the use of an automatic control, but it would not be practical because of the detailed attention and the amount of work and time that would be required to regulate the wells properly by hand.

There is nothing new about the trap method of flowing small wells. The method has been used by many operators, but has usually been discontinued because of the inconvenience and trouble in proper regulation. Automatic control is believed to be essential for its success.

It is doubtful if it would pay you to install a compressor plant and the other equipment necessary to operate so few small wells by this method. With proper automatic control the method should be most valuable in the operation of small wells on large properties that are being repressured.

A FEW ABOUT CROOKED HOLES

I read your department with interest in every issue and am taking this opportunity to learn whether or not you can give me some accurate data on a problem in which I am interested. I am placing this problem before you as a series of questions, and while I do not expect or need exact figures in the answers, I would like to get reliable approximations.

1. What percentage of drilled wells are estimated to be crooked?

2. In holes drilled to a total depth of 3,000 feet or over, what is the approximate average deviation of the bottom of the hole from a point directly beneath the surface location?

3. What is the maximum known deviation from vertical? (Note, I realize that the inclination and hardness of the various strata has considerable bearing on the path taken by the drill and only expect you to give me roughly approximate figures in these questions.)

4. Can you give me very brief resumé of the various methods used to measure or determine the path of the drill in crooked holes?

5. Do you have references to any published articles on these methods?

6. To what extent are the oil companies interested in this subject? Are any companies doing research work on methods of determining the path of the drill in crooked holes?

7. If a reasonably accurate and reliable method of obtaining the location of the bottom of the hole relative to the surface location, and if desired, a projection of the path of the drill, were available, do you think there is enough interest in the problem to warrant the establishment of a company to make such determinations on a contract basis?

8. It is my understanding that there is a company engaged in such work in California. Could you give me the name and address of this company?

I would appreciate having an answer to as many of these questions as possible by mail. Any information at all that you have available will be appreciated.—M. C. M.

Such information as this department is able to give in response to the foregoing communication follows in the order of the questions:

1. Any estimate upon this question would be a mere guess. The information asked is not available.

2. This also would be a mere guess because of the wide variations and meager information upon the subject.

3. This is not known. You can find figures upon the drift of certain wells, however, in the literature upon crooked holes.

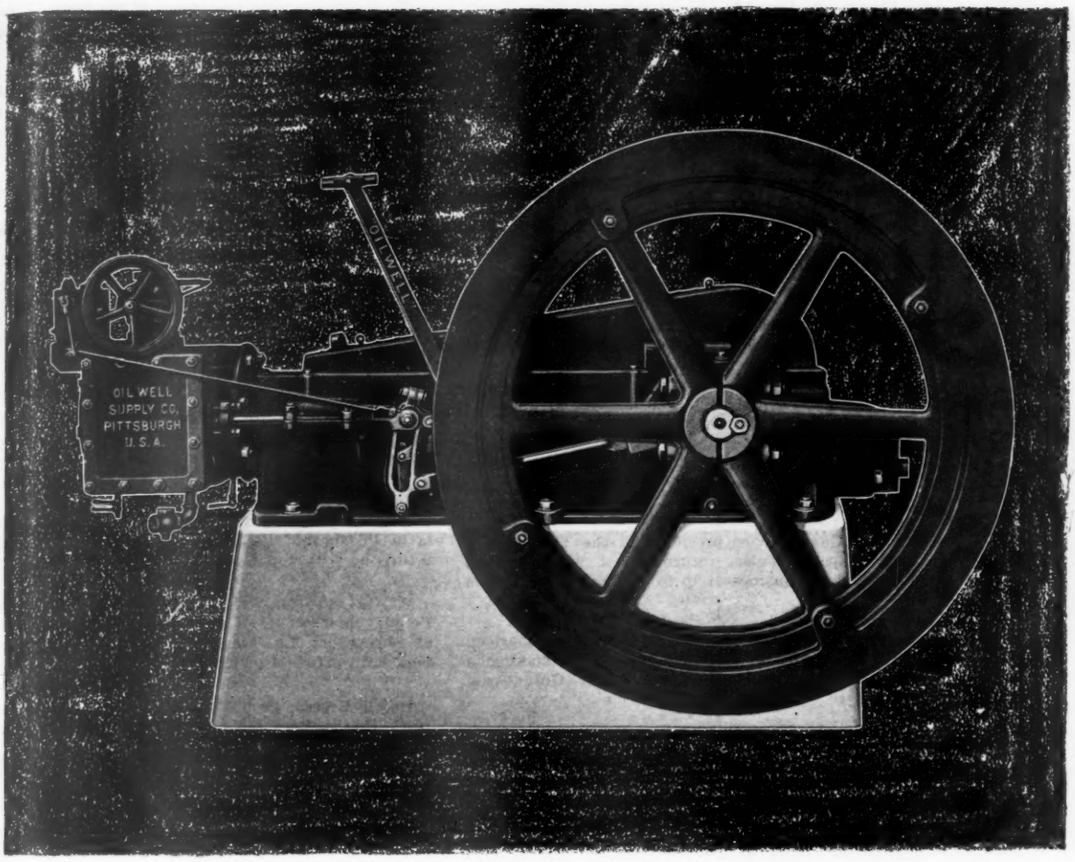
4. Acid bottle test, paraffin method, gyroscopic compass method, Alexander Anderson method.

5. You should obtain a copy of the bibliography upon the crooked hole problem that has been prepared by Miss Florence W. Lundell, technical librarian, Tulsa Public Library, Tulsa. Papers describing well survey methods are included in this reference list.

6. Some of the California companies are having surveys made of their wells. The most general interest thus far manifested is in drilling straighter holes in order to reduce drilling and production troubles.

7. It may come some time, however whether or not the oil companies would have enough work of this kind to support a company on that work alone is problematic.

8. Alexander Anderson, consulting engineer, of Fullerton, Calif., is doing this work.



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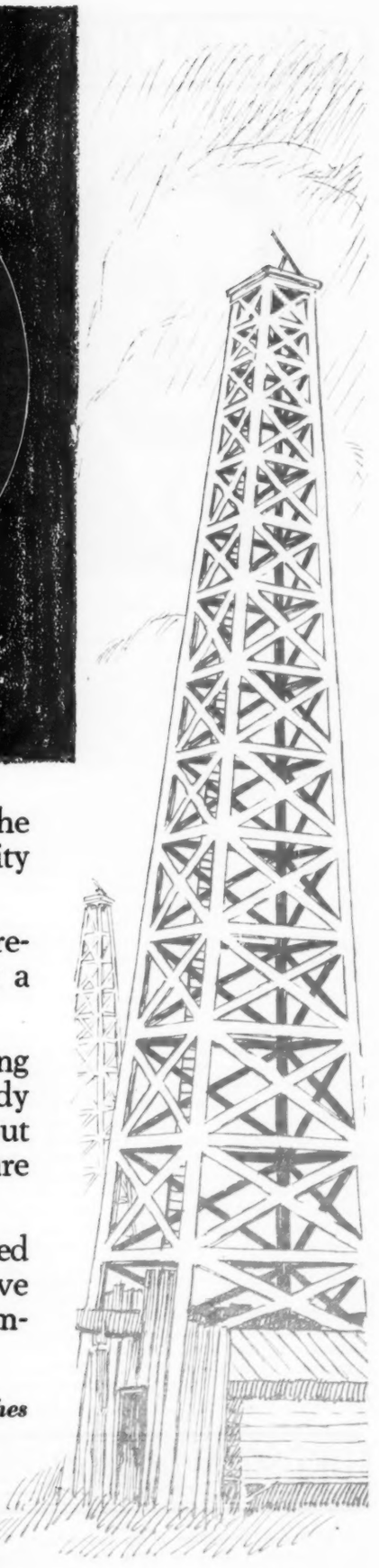
Detailed information will be cheerfully furnished at any of our 100 Branches



UPPLY CO.

BURGH, U.S.A.

BRANCH STORES
IN ALL OIL FIELDS

MEN KNOWN IN OILDOM

William V. Bowles

The reason that William V. Bowles, division manager of the South Texas division of The Texas Company's producing department, did not attend Texas A. and M. and graduate as he had planned is that he was caught in the whirlwind of excitement that accompanied the Spindletop oil boom when it was at its height. He had just graduated from high school at 17 in Houston, Miss., and the family at this juncture moved to Beaumont, Tex. Young Bowles' career as an oil man began with a job firing a boiler for the German-American Oil Company, but he had a natural aptitude for machinery and he soon qualified as a rotary driller.

Mr. Bowles built for the German-American company at Spindletop the first earthen reservoir for oil and he saw 75,000 barrels of oil in this reservoir destroyed by fire caught from burning refuse oil on near-by marsh land. When sand began to interfere with oil production Mr. Bowles devised a screen to keep the sand out.

After three years with the German-American, Mr. Bowles with his father and two brothers, organized a producing company which operated in Spindletop. With one of his brothers he became interested also in a Glenn Pool, Oklahoma, lease. For several years after the sale of his holdings in Glenn Pool and Spindletop Mr. Bowles was an independent producer and contractor. In 1915 he joined The Texas Company as a driller at West Columbia, then wildcat territory. A year later he was moved to Houston as chief scout. Next he was field superintendent at West Columbia, then assistant general superintendent and eventually general superintendent. The title later was changed to the present one, but the duties remained the same.

Except for a few months in Oklahoma Mr. Bowles, ever since he first went to Beaumont, has spent all his time in the Gulf Coast and adjacent oil fields and he is recognized as an authority on conditions in that area. He married Miss Edna Henderson, of Corsicana, Tex., in 1908 and they have one daughter. He is credited with playing a good game of golf.

PERSONAL PARAGRAPHS

E. H. Moore, president of the Independent Oil & Gas Company, is back in Tulsa after spending 10 days in New York.

* * *

C. O. Maddox, of Laredo, Tex., independent oil producer, was a business visitor in Houston, Tex., the past week calling on several of the company officials.

Eugene F. Conners, oil operator of New York, spent a few days in Tulsa last week.

* * *

E. J. Stump, has returned to Wichita Falls, Tex., from a week's business trip to Kansas City and St. Louis, Mo.

* * *

D. C. DeVito, independent operator in New Mexico, was a visitor in Fort Worth, Tex., enroute to Chicago, Ill.

* * *

H. C. Price, of the Welding Engineering Company, Bartlesville, Okla., was a recent visitor in Dallas and Houston, Tex.

* * *

Chester Herndon, of the Smith Separator sales department, is back in Tulsa after making a 10 days' trip to Muskegon, Mich.

* * *

A. B. Smith, president of the Pandem Oil Company, was a visitor in Tulsa last week, and has returned to his home in New York.

* * *

W. D. Richardson, Fort Worth, Tex., president of the Richardson Refining Company, has returned to his headquarters following a trip to Chicago, Ill.

* * *

A. F. Garrett, vice president of the Tidal Refining Company, Tulsa, returned last week from a several days' business trip to points in the Middle West.

* * *

John H. Moran, sales manager of the American Tank Company of Oklahoma City, is making a business trip to Houston and other Gulf Coast points.

* * *

O. A. Jennings, manager of the commercial department of the Oklahoma Gas & Electric Company of Oklahoma City, has recovered from a recent operation.

* * *

W. E. Hoshall and H. Curtis Pitts, independent operators of San Antonio, Tex., spent several days in Houston recently visiting various company officials.

* * *

Philip S. Graver, first vice president of the Graver Corporation of East Chicago, Ind., visited the Fort Worth offices of the company during the past week.

* * *

A. P. Berry, of the sales department of the Lucey Products Corporation, New York City, has been transferred to the Gulf Coast, having offices at Houston, Tex.

* * *

John S. Bonner, vice president of Humble Oil & Refining Company, has been enjoying a short hunting trip in southwest Texas on the King ranch in Kennedy County.

* * *

D. J. Moran, newly elected president of the Marland Oil Company, has arrived at Ponca City, Okla., where he has assumed active charge of the company's operations.

* * *

F. A. McMurray, sales manager of the M. B. Skinner Company, South Bend, Ind., was in Houston, Tex., the past week calling on the trade in the Gulf Coast territory.

* * *

George D. Locke, vice president in charge of sales for the Barnsdall Oil Company, dropped down from Chicago, Ill., to spend a few days at the company's main office in Tulsa.

* * *

W. D. Rowland, of the Superior Oil Producing Company, Wichita Falls, Tex., returned from an extended hunting trip throughout New Mexico and brought back a big buck deer.

* * *

Jack Hesterly, chief scout for the Louisiana Oil Refining Corporation, has returned to Shreveport, La., after making his headquarters in Midland, Tex., for the past two months.

* * *

O. R. Seagraves, of the Moody-Seagraves interests and president of the Houston Gas & Fuel Company, Houston, Tex., is in Monterrey, Mexico, looking over the route of the new gas line his company is to lay from Laredo, Tex., to Monterrey. Ramon Munoz, of Monterrey, engineer on the project, who has been in Houston, returned with him.

W. B. Heroy, vice president of the Sinclair E fining Company, and W. L. Connolly of the sa company, are in Venezuela.

* * *

Roy E. Dickerson, of the Venezuela Atlantic R fining Company, and Fred W. Shay of the Standa Oil Company of New Jersey, have sailed for Ven zuela.

* * *

A. M. Blow, vice president and general manag of the Amerada Petroleum Corporation, has r turned to his Tulsa headquarters following a su cessful deer hunt in West Texas.

* * *

R. H. Cummins, vice president, Marland E ployees Royalty Company, with headquarters Fort Worth, Tex., has returned following a tr through West Texas and New Mexico.

* * *

James D. Hughes, geologist and engineer of Hou ton, Tex., has left for Maracaibo, Venezuela, Sou America, where he will have a position with th Lago Petroleum Company in testing new equipmen

* * *

John L. McMahon, Wichita Falls, Tex., divisio manager for The Texas Company, in North Texa is in Pittsburgh, Pa., on a business trip. On h return he will stop in Chicago, Ill., for a few day

* * *

W. L. Stratton, vice president, and Bonne Peters, chief scout, of the Standard Oil Compan of Shreveport, La., were in Baton Rouge on bus ness with officials of the company's refinery there

* * *

Ralph Brehm, geologist in charge of subsurfac work in the Rocky Mountain area for the Texa Production Company, recently gave several le tures to the sedimentary petrography class at th Colorado School of Mines, Golden, Colo.

* * *

O. E. Randolph, superintendent of productio and A. Neill, superintendent of the gas division fo the Prairie Oil & Gas Company in the Ranger di trict, have returned to their Ranger headquarter from a business trip to Wichita Falls, Tex.

* * *

W. N. Alexander, vice president, and H. Packard, head of the Continental Oil Compan geological forces, are on an airplane tour of in spection of the company's properties in the San Angelo and other Southwest Texas areas.

* * *

Herman Taubman, president of the Taubman Supply Company, is making a five weeks' trip t Washington, D. C., New York, Akron, Ohio, an will visit the American Petroleum Institute meet ing at Chicago before returning to his home i Tulsa.

* * *

Walter O'Roark, of the Standard Oil Company of Louisiana, Gene Morehead, of the Simms Oi Company, and Brooks Van Horn, of The Texa Company scouting departments at Shreveport, La drove to New Orleans for the Centenary-Loyol football game.

* * *

B. D. Dawson, sales manager for the Burford Oil Company which is completing a new refiner at Pecos City, Tex., and who has been busy at th Shreveport headquarters of the company for the past few months, has gone to Pecos to establish his office and residence in anticipation of the be ginning of operations at the plant in December.

* * *

E. R. Perry, chairman of the board of directors H. G. Davies, president, and J. H. O'Rear, vic president of Superior Oil Corporation, have left Tulsa for Shreveport, La., to meet George F. Na phen and M. M. Cunniff of Naphen & Company New York. They will make a tour of the prop erty of the Superior Oil Corporation in six states

* * *

Otto Koch, president of the Kendall Refining Company, Bradford, Pa., last week was host to a number of eastern refiners at a game dinner held at the Lafayette Fish and Gun Club. Mr. Koch who recently returned from a several weeks' vaca tion in California, gives this dinner annually. Among those in attendance were R. W. Wotowich New York City; P. H. Tarbox, Oil City; O. F Keeney, New York City; Fayette B. Dow, Wash ington, D. C.; and Herbert Eaton of Warren, Pa.

KANSAS WILDCATS

(Continued from Page 40)

Marland Oil Co.'s No. 1 Vine, SW cor. SW SE Sec. 27-11-19w ..... Drlg. 1,650 ft.
Stearns & Streeter's No. 1 Plummer, NW cor. SE Sec. 2-11-17w ..... Oswalt lime 3,034-39; 60 bbls. day.
J. B. Slick, Inc.'s No. 1 Craig, C NW NE Sec. 8-11-16w ..... Drlg. 2,916 ft.

EDWARDS COUNTY

Amerada & Wilcox' No. 1 Teansil, C NW SW Sec. 32-25-19w ..... Underreaming 3,525 ft.

GEARY COUNTY

Pioneer Oil Co.'s No. 1 Chase, SE cor. SE Sec. 10-12-7 .... Drlg. 3,503 ft.
Wright et al's No. 1 Younker, NW cor. NE Sec. 17-11-5 .... Drlg. 1,074 ft.

GRAHAM COUNTY

Gulf Coast Oil Co.'s No. 1 Johnson, C S half Sec. 27-8-25w ..... Drlg. 2,450 ft.

GREENWOOD COUNTY

Bisagno et al's No. 1 Gilroy, NW cor. SW SW Sec. 8-25-13 ..... Dry and abandoned 1,642 ft.
W. H. Ballew's No. 1 Bright, NE cor. SW Sec. 25-27-12 .... Shut down 1,210 ft.
Ladow Gas Co.'s No. 1 Lawrence, SE cor. SW SE Sec. 4-27-13 ..... Dry and abandoned 1,630 ft.
Ward McGinnis' No. 1 Robbins, NE cor. NW Sec. 16-24-9 .. Dry and abandoned 2,555 ft.
Hanley et al's No. 1 Peterson, NW cor. NE SE Sec. 4-26-13 ..... 1,000,000 ft. gas, 1,528-31 ft.; completed.

HARPER COUNTY

Amerada Pet. Corp.'s No. 1 Mendiville, C E SE Sec. 24-34-6w ..... Fighting cave 5,366 ft.
R. S. Austin's No. 1 Nieman, SW cor. SW Sec. 21-24-2 .... Drlg. 2,375 ft.

JEFFERSON COUNTY

Wichita Oil Co.'s No. 1 Simpson, NW cor. SW SW Sec. 19-10-17 ..... Rigged up and shut down.

JACKSON COUNTY

Garvin & Morton's No. 1 Lutes, SW cor. NW NW Sec. 27-7-15 ..... Shut down 940 ft.

LANE COUNTY

Blankenship Pet. Co.'s No. 1 Schaeffer, NE cor. NE Sec. 24-16-28w ..... Spudded.

LYON COUNTY

T. K. Simmon's No. 1 Milner, SE cor. NW Sec. 35-21-11 .. Dry and abandoned 2,095 ft.

MARSHALL COUNTY

Irwin et al's No. 1 Cooper NE cor. NW Sec. 10-3-7 ..... Drlg. 620 ft.

MARION COUNTY

Prairie O. & G. Co.'s No. 1 Theis, NW cor. NW Sec. 15-19-4 ..... Dry and abandoned 2,715 ft.
Empire Oil & Ref. Co.'s No. 1 Burhart, SE cor. NE NE Sec. 11-20-3 ..... Drlg. 1,043 ft.
J. E. Hauna's No. 1 Pankratz, NE cor. NE SW Sec. 13-20-3 ..... Rig.
Empire Oil & Ref. Co.'s No. 1 Jenson, SE cor. NW Sec. 26-22-5 ..... Drlg. 1,050 ft.
Courtney B. Davis' No. 1 Rampel, SE cor. NE SE Sec. 7-19-3 ..... Chat 2,424-58 ft., 8,000,000 gas spraying 5 bbls. oil per hour.
A. E. Meyers, No. 1 Papp, SW cor. SW NE Sec. 10-18-2 .. Spudded.
Raymond Gear's No. 1 Larson, NW cor. SW NW Sec. 18-21-4 ..... Shut down 2,320 ft., corrected.
Empire Oil & Ref. Co.'s No. 1 Siebert, SW cor. SE Sec. 28-20-2 ..... Sand 2,425-27 ft., 1,500,000 ft gas, shut in.

MEADE COUNTY

Blackwell O. & G. Co.'s No. 1 Beyer, SE cor. NW SE Sec. 9-33-28w ..... 500,000 ft. gas and 2 bailers water total depth 4,356 ft.

MITCHELL COUNTY

Ben Gurley et al's No. 1 Crombil, C NE NE Sec. 32-9-7w ..... Drlg. 3,575 ft.

MORRIS COUNTY

Hugh Faulder's No. 1 Wendt, SW cor. SE SE Sec. 18-15-5 ..... Spudded.
Loomis & Anderson's No. 1 Young, NW cor. SE, Sec. 14-17-7 ..... Drlg. 1,730 ft.
Skelton et al's No. 1 Iles, NW cor. NW Sec. 25-16-5 .... Rig.
General Utilities Co.'s No. 1 Sanford, NE cor. NE Sec. 15-16-7 ..... 3,000,000 ft. gas 1,436-38, shut in.
O'Day et al's No. 1 Scott, NE cor. SW Sec. 6-16-6 ..... Rig.

McPHERSON COUNTY

Galt-Brown's No. 1 Blaine, C NE Sec. 18-17-1w ..... Drlg. 3,362 ft.
Ted Washabaugh's No. 1 Vosshell, NE cor. NE Sec. 9-21-3w ..... Drlg. 520 ft.
Lariaux et al's No. 1 Martinsdn, NE cor. Sec. 9-19-3w ... Rig.
McPherson Gas Co.'s No. 1 Stein, SW cor. NE SW Sec. 17-18-1w ..... Drlg. 2,650 ft.
McPherson Gas Co.'s No. 1 Gustafson, C NE Sec. 9-17-2w ..... Drlg. 2,918 ft.
W. C. Newman's No. 1 Diepenbrock, NW cor. NE Sec. 2-17-1w ..... Drlg. 3,057 ft.
McPherson Gas Co.'s No. 1 Wedell, C SW Sec. 12-20-2w ..... Drlg. 1,360 ft.
Vickers Pet. Co.'s No. 1 Wedel, C SW Sec. 12-20-2w ..... Rig.

OSAGE COUNTY

York State Oil Co.'s No. 1 Smith, SE cor. SW NW Sec. 18-18-15 ..... Reaming 2,085 ft.

OSBORNE COUNTY

T. C. Johnston's No. 1 Cooley, C NW NE Sec. 15-8-15w ... Underreaming 3,225 ft.
L. D. Jarvis' No. 1 Jellison, SE cor. SE Sec. 13-10-15w ... Spudded and shut down.

OTTAWA COUNTY

Anderson et al's No. 1 Bank, NE cor. NW Sec. 28-10-2w .. Drlg. 2,750 ft.

PAWNEE COUNTY

F. C. Troupe's No. 1 Lovett, CEL NE NE Sec. 31-21-16w . Shut down 1,560 ft.

PHILLIPS COUNTY

Watsonian Oil Co.'s No. 1 Marklein, NE cor. SW Sec. 21-3-19w ..... Drlg. 2,720 ft.

RENO COUNTY

Empire and Marland's No. 1 Williams, SE cor. NE Sec. 5-26-4w ..... Dry and abandoned 4,144 ft.

RICE COUNTY

Allison & Fitzwilliams' No. 1 Poland, NE cor. SW NE Sec. 36-19-8w ..... Cellar.

ROOKS COUNTY

Phillips Pet. Co.'s No. 1 Overholtzer, C SE Sec. 30-9-16w .. Dry and abandoned 3,665 ft.
Empire G. & F. Co.'s No. 1 Woodrill, NE cor. SE NW Sec. 15-8-18w ..... Drlg. 3,116 ft.
Prairie Oil & Gas Co.'s No. 1 Sandberg, C SW Sec. 20-9-18w ..... Rig.
Krueger et al's No. 1 Poore, NE cor. NE Sec. 14-8-16w .. Drlg. 1,911 ft.
Burford & Brimm's No. 1 Toxa, NE cor. SW SE Sec. 22-19-17w ..... Spudded and shut down.
Krueger et al's No. 1 Poore, NE cor. NE Sec. 14-8-16w .. Drlg. 2,730 ft.
Skelly & Mid-West's No. 1 Jones, SW cor. NE NW Sec. 2-7-16w ..... Shut down 3,485 ft.

RUSH COUNTY

Danciger Valerius & Chenney's No. 1 Schuerman, NW cor. SE NW Sec. 27-17-17w ..... 11,000,000 ft. gas 3,575-79 ft.
Sinclair Oil & Gas Co.'s No. 1 Berching, NW cor. NE NW Sec. 9-16-16w ..... Drlg. 2,050 ft.

RUSSELL COUNTY

Douglas Oil Co.'s No. 1 Stoppel, SE cor. SW NE Sec. 23-14-11w ..... Dry and abandoned 3,505 ft.
Gypsy Oil Co.'s No. 1 Cook, C NE SE Sec. 10-13-15w .... Dry and abandoned 3,448 ft.
Stearns & Streeter's No. 1 Haise, NE cor. SE SE Sec. 36-12-15w ..... Shut down top Oswalt lime 2,974 ft.
Joe Liggett's No. 1 Maier, SE cor. NE SE Sec. 8-11-15w .. Top Oswalt 3,016 ft.; show oil and water drlg. 3,280 ft.

SALINE COUNTY

M. Esty et al's No. 1 Peterson, C NE Sec. 6-16-5w ..... Spudded and shut down.
Boyle et al's No. 1 Miller, SW cor. SE Sec. 21-16-1w ..... Drlg. 2,040 ft.
Nathan Jones et al's No. 1 Robertson, NW cor. SW Sec. 27-14-2w ..... Shut down 1,500 ft.

SEDGWICK COUNTY

Bu-Vi-Bar Pet. Co.'s No. 1 Wright, SE NE SE Sec. 12-26-1w ..... Sand 3,367-68 ft., flowing 1,700 bbls. daily.
Bu-Vi-Bar et al's No. 1 Roberts, SE cor. SW Sec. 1-26-2w ..... Rig.
E. B. Shawver et al's No. 1 Broeis, NE cor. SW Sec. 5-26-2e ..... Rig.
Lewis et al's No. 1 Taylor, NW cor. NE Sec. 23-27-2 .... Spudded and shut down.
J. H. Tatlock et al's No. 1 Goeldner, NW cor. NE Sec. 6-29-2e ..... Drlg. 1,850 ft.
La Robb Oil Co.'s No. 1 Davis, SE cor. SE Sec. 36-25-1w .. Drlg. 2,465 ft.
Maglason et al's No. 1 Buckles, NW cor. SE Sec. 3-28-1w .. Shut down 250 ft.
Barnsdall Oil Co.'s No. 1 Faber, SW cor. NW Sec. 6-27-1w ..... Drlg. 2,120 ft.
Bu-Vi-Bar Pet. Co.'s No. 1 Steel, SE cor. SE Sec. 1-26-2w. Drlg. 2,325 ft.
Connell & Slick's No. 1 Cross, NE cor. NE Sec. 27-25-1w .. Drlg. 1,200 ft.
Allison & Fitzwilliams' No. 1 Doane, NE cor. NW NE Sec. 24-26-1w ..... Drlg. 3,506 ft.
VanZant & Mason's No. 1 Fox, C NW SW Sec. 19-25-1w .. Drlg. 2,150 ft.
Barnsdall Oil Co.'s No. 1 Samuels, NE cor. NW Sec. 24-25-1 ..... Fishing 1,400 ft.
Marland Prod. Co.'s No. 1 Goodrich, SW cor. NE SW Sec. 16-25-1 ..... Rig.

SEWARD COUNTY

T. B. Slick's No. 1 Pyle, NE cor. NE Sec. 14-33-33w ..... Dry and abandoned 5,036 ft.

SHERMAN COUNTY

A. L. Henson et al's No. 1 Murry, NE cor. SE NW Sec. 27-7-40w ..... Shut down 3,035 ft.

STEVENS COUNTY

Trees Oil Co.'s No. 1 Thompson C NE SW Sec. 3-35-38w .. Casing trouble 600 ft.
W. Sidwell et al's No. 1 Kelly, SW cor. NE Sec. 16-34-38w ..... Shut down 1,213 ft.
McKanna et al's No. 1 Haun, SE cor. NE Sec. 10-33-38w .. Shut down 1,440 ft.

SUMNER COUNTY

McCulloch Oil Co.'s No. 1 Teettle, SW cor. NE Sec. 29-34-1w ..... Drlg. 4,100 ft.
Gypsy Oil Co.'s No. 1 Williams, NW SE SW Sec. 16-35-3w ..... Drlg. 3,910 ft.
Helmerich & Paynes' No. 1 Warlick, SE cor. NE Sec. 8-34-2 ..... Drlg. 2,730 ft.
Otstot et al's No. 1 Barlow, SE cor. SE Sec. 22-33-3w ... Wilcox sand 4,479-4,500 ft.; show oil and gas, 600 feet water.
George Dickey's No. 1 Knox, SW cor. NE Sec. 3-35-1w ... Drlg. 4,213 ft.
Otstot et al's No. 1 Volker, NW cor. NE Sec. 9-35-1 ..... Rig.
Davidson and others' No. 1 Strickland, SW cor. SE Sec. 12-35-1w ..... Rig.
Sam Jarvis' No. 1 Warnecke, SE cor. SW Sec. 4-34-3w ... Dry and abandoned 4,686½ ft.

TREGO COUNTY

Central Commercial Oil Co.'s No. 1 Ellis, NE cor. SW NE Sec. 20-13-21w ..... Drlg. 2,125 ft.

WASHINGTON COUNTY

McCool & Vincent's No. 1 Linn, NW cor. NE Sec. 27-4-3 .. Rig.

KANSAS FIELDS

(Continued from Page 40)

fining Co. and La Robb Oil Co.'s No. 2 Sluss, NE cor. SE NW, Section 6-27-6, is making 250 bbls. from sand at 2,718-46 feet. Garden and others' No. 4-A Sluss, NW cor. SW NE, Section 6-27-6, made 300 bbls. from sand at 2,705-38 feet.

Dixie Oil Co.'s No. 2 Stearns, NE cor. SW SE, Section 28-27-6, is making 20 bbls. from sand at 3,048-58 feet. Empire Oil & Refining Co.'s No. 1 Young, NW cor. SE NW, Section 27-26-7, is dry and abandoned at 3,135 feet. No. 3 Willets, NW cor. SE NW, Section 27-27-5, is dry and abandoned at 2,775 feet. No. 1-B Marshall, NW cor. SW SW, Section 15-27-6, is a dry hole at 3,110 feet. Phillips Petroleum Co.'s No. 6 Seward, NW cor. Section 13-27-7, has been abandoned at 2,688 feet. Galbraith and others' No. 1 Steel, SW cor. Section 26-25-4, has been abandoned at 800 feet.

Clark County

Watchorn Oil & Gas Co.'s No. 3 Stephens, CWL NW NW, Section 21-32-21w, has been shut in for 12,000,000 feet of gas.

Coffey County

Ellis and others' No. 1 Vannoy, SE cor. NE, Section 1-23-14, has been completed for 3,000,000 feet of gas.

Cowley County

J. A. Hull has the cellar dug for No. 18 Kukuk, NE cor. SE NE, Section 24-32-4. Broer and others made location for No. 1 Conrad, NE cor. NW SW, Section 35-31-6. Lewis Production Co. made location for No. 1 Conrad, NE cor. NW SW, Section 30-31-6. E. B. Shawver has rig timbers on the ground for No. 2 Beard, SW cor. SE NE, Section 17-34-3. Kentucky Nitrogen & Oxygen Co.'s No. 1 Melick, CNL SE SW, Section 13-34-6, is drilling at 1,000 feet. Wakefield and others made location for No. 1 Osborne, NW cor. NE, Section 19-30-5. Dewey and Barnsdall Oil Co.'s cellar is dug for No. 1 Smith, SE cor. SW NE, Section 36-31-4.

John Herron's No. 1-A Marshall, SW cor. NE, Section 36-30-6, made a 40-bbl. well in sand at 2,891-2,901 feet. Trees Oil Co.'s No. 3 Hittle, NW cor. SE NE, Section 21-31-4, has been completed for 30 bbls. in sand at 2,400-11 feet. Pyle, Sutter and others' No. 1 Carson, SW cor. SE SW, Section 21-30-3, is dry and abandoned at 3,564 feet.

Vernon Oil & Gas Co. and Shell Petroleum Corp.'s No. 1 Gilmer, SE cor. NW NE, Section 6-30-4, is dry and abandoned at 3,084 feet. E. B. Shawver and others' No. 1 Tucker, SE cor. NW, Section 12-30-4, has been abandoned at 2,818 feet.

Elk County

Elk Petroleum Co. moved the rig out for No. 11 McIntyre, SW cor. NW NW, Section 9-30-9. S. H. Litteral is moving material in for No. 1 Moline Townsite, Block 45, Lot 13, SW cor. SE SW, Section 10-31-10. Denton and others' No. 1 Lovett, NE cor. NW NW, Section 15-31-10, is moving in material. Croft & Hunt's No. 1 Webb, NW cor. NE NW, Section 15-31-10, is moving in. Wahn and others' No. 1 Murphy, NE cor. NW NE, Section 27-31-10, is drilling at 900 feet. Tory & Murfin's No. 1 Moline Townsite, Block 40, Lot 10, NE cor. SW SW, Section 10-31-10, is rigging up. Sharkey & Ames' No. 1 Moline Townsite, Block 45, Lot 7, SE cor. SW SW, Section 10-31-10, is moving in material.

Minnehoma Oil Co. and Murphy's No. 3 Denton, SW cor. NW SW, Section 3-31-8, has been completed for 750 bbls. in sand at 1,951-73 feet. Derby Oil Co.'s No. 1 Rhudy, SW cor. NW SW, Section 4-31-10, made 20 bbls. from sand at 1,568-78 feet. Elk Petroleum Co.'s No. 1 Hyde, NE cor. SE NW, Section 9-30-9, made 50 bbls. from sand at 2,482-2,507 feet. Minnehoma Oil Co.'s No. 2 Ferguson, NW cor. SW, Section 3-31-8, is producing 250 bbls. from sand at 1,918-32 feet. Litteral and others' No. 1 Moline Townsite, Block 27, Lot 3, NW cor. NE SW SW, Section 10-31-10, made a 200-bbl. well in sand at 1,977-2,011 feet. Benge & Bandeventer's No. 1 Bateson, SW cor. NW, Section 24-28-11, is dry and abandoned at 1,435 feet.

Ellis County

Phillips Petroleum Co. has the rig on the ground for No. 1 Schmeisler, NW cor. Section 20-12-17w.

Franklin County

Howard & Howarth made location for No. 1 Case, C SE SE, Section 25-16-17.

Greenwood County

Phillips Petroleum Co.'s No. 1 Mead, NE cor. NW, Section 35-23-11, swabbed 68 bbls. in three hours from sand at 1,835-61 feet, and they are preparing to shoot. Empire Oil & Refining Co.'s No. 12-A Ott, NE cor. SW NW, Section 25-22-12, is drilling at 1,500 feet. The Texas Company's No. 1 Edwards "C," NE cor. NW SE, Section 21-23-11, is a rig on the ground. La Robb Oil Co. is moving in material for No. 1 Teeter, NW cor. SW SW, Section 18-25-9. C. L. Sheedy's No. 1 Newman, SE cor. SW SE, Section 32-23-13, is drilling at 200 feet.

Amerada Petroleum Corp.'s No. 4 Luthi, NW cor. NE SW, Section 29-22-13, made 50 bbls. from sand at 1,669-1,701 feet. La Robb Oil Co.'s No. 1 Jackson, NE cor. NW SW, Section 1-25-8, is dry and abandoned at 2,385 feet. McCulloch Oil Co. and others' No. 1 Mahurin, SW cor. SE NW, Section 13-27-11, is dry and abandoned at 1,839 feet. Polhamus and others' No. 1 Hull,

NE cor. SE NE, Section 24-24-8, has been abandoned at 2,400 feet. Chisler and others' No. 2 Freeman, CEL SE NW, Section 19-24-11, is dry and abandoned at 2,005 feet.

Harvey County

Garland and others made location for No. 1 Cox, NE cor. Section 27-24-1w. Helmerick, Payne and others made location for No. 1 Schmidt, SE cor. NE SE. Section 2-22-1.

Jackson County

Smith and others' No. 1 Wabaunce, NE cor. NW, Section 3-8-14, has been abandoned at 2,953 feet.

Lyons County

T. K. Simmons' No. 1 Heidrick, SE cor. NW, Section 35-21-11, is dry and abandoned at 2,095 feet.

McPherson County

The Texas Company made location for No. 3 Chinberg, SE cor. NW, Section 32-18-2w. Marland Oil Co. and others made location for No. 1 Wilke, C SW SW, Section 9-21-1w. The Texas Company's No. 1 Chinberg, NW cor. NE NW, Section 32-18-2w, has been completed for 7,250,000 feet of gas in sand at 2,966-72 feet.

Marion County

Hartman & Skaer made location for No. 1 Kline, NE cor. NW, Section 28-18-3. Phillips Petroleum Co. made location for No. 1 Rumald, NE cor. NW, Section 10-17-4. Givens & Hershey's No. 2 McCoy, SE cor. NE, Section 14-17-4, has been completed for 75 bbls. in chat at 2,340-80 feet. Johnson and others' No. 1 McCoy, NE cor. NW SE, Section 14-17-4, made 100 bbls. from chat at 2,331-79 feet. Phillips Petroleum Co.'s No. 1 Thava, SW cor. NE SE, Section 22-17-4, has been completed for 75 bbls. in chat at 2,369-2,409 feet. Empire Oil & Refining Co.'s No. 1 Alder, NE cor. SE NW, Section 32-21-5, is dry and abandoned at 2,425 feet. Rosenthal and others' No. 1 Tadchman, NW cor. SW SW, Section 13-17-3, is a dry hole at 2,547 feet.

Riley County

W. R. Wilson's No. 1 Rennels, C W half, Section 4-11-8, is dry and abandoned at 2,310 feet.

Russell County

Wilcox Oil & Gas Co. made location for No. 1 Dortland, NW cor. Section 4-14-15w. Midwest Exploration Co. has the rig on the ground for No. 1 Mermas, NE cor. Section 5-14-15w. Liggett and others' No. 1 Maier, SE cor. NE SE, Section 8-11-15w, is dry and abandoned at 3,433 feet. Midwest Exploration Co. and others' No. 33 Bronson, SE cor. SW SE, Section 20-11-15w, made a 40-bbl. well in sand at 3,141-78 feet.

Sedgwick County

Lario Oil Co. and others made location for No. 1 Tiden, C NE SE, Section 22-29-2w. Morgan and others moved the rig out for No. 1 Corn, SW cor. NE, Section 28-25-1w.

Sumner County

Morgan and others' rig is up for No. 1 White, SE cor. SW, Section 16-35-2. Shawver and others' No. 1 Spense, SE cor. NE, Section 27-34-2, is drilling deeper at 3,700 feet. Roxana Petroleum Corp.'s No. 3-A Rothwell, SW cor. NE SW, Section 14-32-2, has been completed for 140 bbls. in sand at 1,608-43 feet. Wentz Oil Corp.'s No. 1 Crane, SE cor. NW NW, Section 23-34-2w, is dry and abandoned at 4,805 feet.

Wilson County

Thompson and others' No. 1 Robinson, SW cor. NE, Section 21-27-14, is dry and abandoned at 960 feet.

Woodson County

Pryor & Lockhart's No. 1 Sassee, NW cor. NE SW, Section 36-23-13, is dry and abandoned at 1,738 feet. Smalley and others' No. 1 Naylor, SW cor. SE NW, Section 13-25-13, is a dry hole at 1,543 feet.

LOUISIANA-ARKANSAS

(Continued from Page 42)

is down 1,455 feet. United Carbon Co. is drilling No. 1 Eright, Section 10-20-4, at 2,000 feet.

Ouachita Parish—Arkansas Natural Gas Co.'s No. 1 Potts, Section 30-19-4, is drilling at 1,610 feet. G. E. Jordan's No. 1 Wall, Section 12-18-3, is in anhydrite at 3,256 feet. Magnolia Petroleum Co. is drilling No. 3 Millsaps, Section 36-20-4, at 1,122 feet and No. 2 Morrison is a new location 330 feet south and 412 feet west NE cor. NW SW, Section 2-19-4. Union Consumers Gas & Producing Co. is drilling No. 2 Slaughter, Section 24-19-4, at 1,855 feet. United Oil & Gas Products Co. cemented 188 feet of 12-inch and is drilling at 825 feet. West Virginia Oil & Gas Co. has derrick up on No. 6 fee, Section 6-18-4.

Union Parish—Moody & Seagraves cemented 6-inch at 2,087 feet on No. 1 Dawkins, Section 17-20-4.

Claiborne Parish

Haynesville—Smitherman & McDonald cemented 9¼-inch casing at 3,600 feet on No. 1 Miller, Section 17-23-8.

Homer—Oakes and others have derrick up, 2,500 feet north and 380 feet west SE cor., Section 19-21-7, for No. 1 Richardson.

LaSalle Parish

Urania—Ayers Brothers are drilling No. 6 Tremont, Section 30-10-2e, at 1,450 feet.

Red River Parish

Bull Bayou—Odell & Lawton's No. 4 Richardson, Section 25-13-11, cemented 6⅝-inch at 2,495 feet and No. 5 is a derrick 2,924 feet west and 2,921 feet south NE cor. SE, Section 24, in Section 25-13-11.

Richland Parish

Community Oil & Gas Co. has rig up for No. 1 Boise in Section 33-16-6. Magnolia Petroleum Co.'s No. 1 McCoy, Section 29-16-6, cemented 8¼-inch at 2,300 feet. Richland Producing Co. is drilling No. 1-D Sartor, Section 32-16-6, at 200 feet.

Webster Parish

Cotton Valley—Magnolia Petroleum Co. has derrick up for No. 4 I. Cox in Section 23-21-10, and has rig up on No. 1 McCook & Hibbler, second hole, in Section 22-21-10. Ohio Oil Co.'s No. 42 Bodcaw, Section 27-23-1, is drilling lime at 3,944 feet. Palmer Corp.'s No. 4 Tillman, Section 28-21-10, is in lime at 3,460 feet. Superior Oil Co. cemented 6⅝-inch casing at 4,350 feet on No. 1 McCook & Hibbler, Section 21-21-10.

Sarepta and Shongaloo—Virgil Helm is drilling No. 1 Martin, Section 7-22-9, at 2,680 feet. Magnolia Petroleum Co. tested 500,000 feet of gas at 2,619 feet and shut down No. 1 Bond, Section 5-22-9, for orders; No. 1 H. M. Branton, Section 5-22-9, has rig up to drill and No. 1 M. M. Branton in the same section is drilling at 300 feet; No. 1 Scroggins, Section 1-22-11, is in sandy lime at 1,920 feet.

ARKANSAS

Nevada County

Humble Oil & Refining Co. cemented 6⅝-inch and is waiting on standard rig to pump from 5 feet of sand on No. 1 J. Haynie, Section 6-14-20, total depth 1,147 feet. No. 2 Hein, Section 1-14-21, cemented 12½-inch surface string at 350 feet.

Ouachita County

Smackover—J. E. Crosbie set 10-inch at 62 feet and 6⅝-inch at 2,014 feet on No. 2 Primm, Section 23-15-16, and made location for No. 3 Primm, 480 feet west and 300 feet south NE cor. SW SW, Section 24-15-16. Simms Oil Co. is arranging to go deeper on No. 11 Hildebrandt, Section 33-15-15, completed June 4, 1926, as a 14,600,000-foot gasser at 2,717 feet.

Union County

Champagnolle—H. L. Hunt is coring No. 3 Gregory, Section 10-17-14, at 3,112 feet. Lion Oil Refining Co. cemented 6⅝-inch casing at 3,055 feet on No. 3 Nash, Section 6-17-13, which showed for 1,000 bbls. on drill stem test, total depth 3,062 feet; No. 2 Rowland, Section 15-17-14, perforated casing from 2,970-80 feet, total depth 3,297 feet; No. 5 Union Sawmill, Section 7-17-13, has derrick up. Magna Production Co. cemented 6⅝-inch casing at 3,076 feet and is arranging for a drill stem test at 3,082 feet. Magnolia Petroleum Co.'s No. 2 Gregory in Section 15-17-14, is drilling at 2,135 feet. Marine Oil Co. set 194 feet of 10-inch surface casing on No. 4 Sample, Section 7-17-13, and is drilling at 1,440 feet. C. E. Murdock is rigging up to deepen No. 1 Gregory, Section 10-17-14, completed December 30 last year pumping 500 bbls. of fluid, 50 bbls. of it oil, from 2,765 feet; No. 2 Union Sawmill, Section 6-17-13, is killing a water flow at 1,410 feet. Ohio Oil Co. has rig up for No. 1 Alphin, Section 7-17-13, and is coring No. 1 Frazier, Section 6-17-13, at 3,016 feet; No. 1 Nash, Account 2, Section 6-17-13, cemented 6⅝-inch at 3,020 feet, total depth 3,022 feet, and No. 3 Nash, Account 1, is drilling at 2,892 feet. Oilwell Corp. cemented 12½-inch at 165 feet on No. 2-A Kelly, Section 9-17-14, total depth 200 feet, and Skelly Oil Co.'s No. 1 Kelly, in the same section, has a fishing job at 1,286 feet.

Smackover—Lovett and others are arranging to test 28 feet of broken formation in No. 1 Goodwin & Stone, Section 3-16-16, total depth 2,100 feet. Simmons and others' No. 1 Green, Section 3-16-16, is standing 1,000 feet in fluid, 98 per cent water, from 2,335 feet.

EAST TEXAS

Harrison County

Nick Barbee set 100 feet of 10-inch casing and is drilling at 580 feet on No. 4-A-2 Furrh in the James Short Survey.

Panola County

Eureka Natural Gas Co.'s No. 1 Becknell in the E. Williams Survey, is drilling at 950 feet. Magnolia Petroleum Co. will plug back to 2,740 feet on No. 2 Steele in the B. C. Jordan Survey to kill a blow out at 3,259 feet and set casing for a test. Natural Gas Producing Co. cemented 6-inch casing at 2,538 feet on No. 2 Moore in the B. C. Jordan Survey, total depth 2,644 feet. D. Thomason cemented 6-inch at 2,460 feet on No. 11 Crenshaw, B. S. Jordan Survey.

ROCKY MOUNTAIN AREA

(Continued from Page 52)

Dome, tied up at 4,890 feet with a fishing job since February, is one of these. Another on the north dome is its No. 1 Peterson, C SW, Section 1-9-79, which blew in last March at 5,115 feet with an estimated flow of 50,000,000 feet of carbon dioxide gas. The third well is the company's No. 1 Hoye, SW NE, Section 34-9-78, on the south dome, which encountered the same gas last April at 4,875 feet. This well also made some oil. Numerous experiments have been made in trying to kill the gas in the two wells and drill to lower horizons. The low temperature of the gas which froze the mud put into the hole, caused blowouts when the ice bridges were drilled out, and supplied operating problems seldom encountered in ordinary drilling, has delayed completion. The temperature at Walden frequently goes to 40 degrees below zero in winter and it was decided not to try any additional work this period.

The Producers & Refiners Corp. has issued orders for work to continue on its No. 1 Hendershot, SE NE, Section 2-6n-86, in the Pole Mountain area. It is delayed at 1,900 feet with frozen water line. It is necessary to bury the line at that location 7 feet to get below the frost. It is believed the next 1,000 feet will show some definite results and an effort will be made to complete it before spring. The Marland Production Co.'s No. 1 Pipe Springs, Section 27-27-49, in Bent County, is shut down at 3,987 feet for water, and the Parker Club, Inc., Section 4-28-68, in Huerfano County, is delayed at 1,210 feet for the same reason.

El Paso County

The Grand Union Oil Co.'s No. 1, NW cor. SW, Section 19-17-67, on the Red Creek structure in El Paso County, between Colorado Springs and the Florence Pool, is an important wildcat at an interesting stage. This is a test of the Pennsylvanian and started in the red beds. Farther to the east and in the Florence district the Dakota of lower Cretaceous age requires drilling from 3,000 to 5,000 feet, but on Red Creek the Harding sand of Pennsylvanian age, which correlates with the Embar of Wyoming to a certain extent, is expected in this well at 2,700 feet. The well is bottomed at 2,449 feet and running the 6⅝-inch to shut off soft ground. It is estimated to be from 10 to 15 feet off the Millsap. Already this is the deepest test geologically drilled in central Colorado. J. C. Edsall, geologist for the company, places the thickness of the red beds in that area at 3,000 feet, based on the log of this well and a former test and outcrops. However, there has been considerable erosion of this formation at the well site and this erosion is estimated at a maximum of 580 feet. The hole is now bottomed in the lower Chugwater.

In Arapahoe County, the McDeb Drilling Co.'s No. 1 Fitzsimmons, NE Section 7-4s-66, is bottomed at 3,660 feet and pulling the 8¼-inch which was set at this depth. There is some water in the hole at this depth with a showing of oil on top. The 6¼-inch will be run and carried to a lower horizon to make a complete shutoff.

In Yuma County, the Major Petroleum, Inc.'s No. 1 Blackwolf, formerly the Etnyre Syndicate, is drilling below 1,050 feet and making good progress after resuming under the reorganization.

Elbert County Wildcat

An interesting report comes from the wildcat being drilled by J. M. Botts and others, in the SE SE, Section 1-8s-59, near Buick, in Elbert County. California interests who are drilling this well have an unusually good rig and camp and have been making considerable progress, but information is withheld not only from the public but other oil companies. An unverified report is to the effect that it is drilling around 3,000 feet and that it has had some substantial oil shows at this depth. It is definitely known that at 800 to 1,100 feet the well had good shows of gas in the shale. The Belmont Oil Co.'s No. 1 Maher, Section 4-6-59, in the same county, is resuming this week at 3,104 feet after enlisting additional capital.

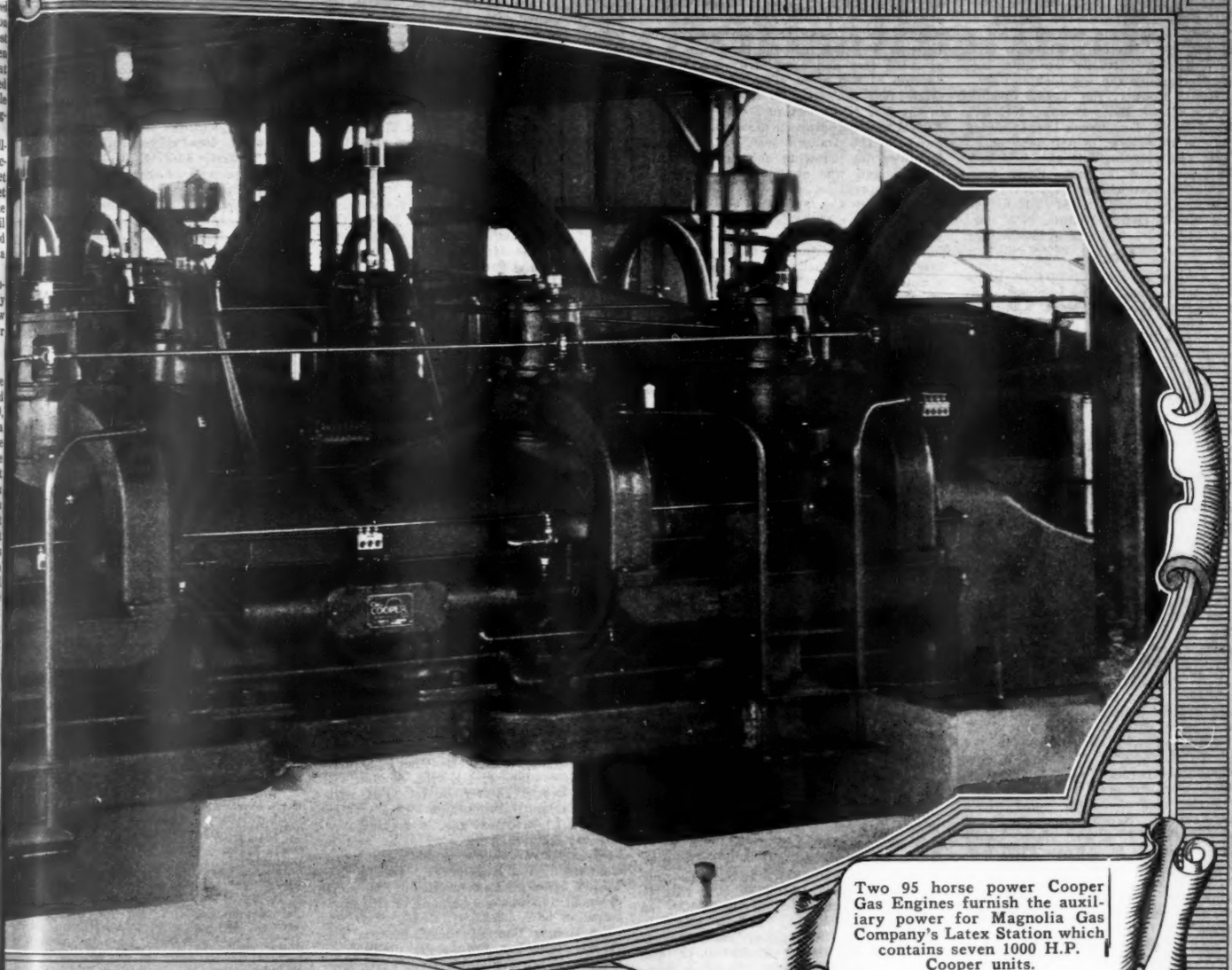
In the southwestern part of the State the Juanita Oil Co.'s No. 1 Harvey, Section 4-32-3w, Archuleta County, is drilling at 710 feet. The Childers Drilling & Producing Co.'s No. 1 Dozier, SW cor. NW, Section 29-33-13, Barker Dome, in La Plata County, is still shut down at 820 feet. It was reported a few weeks ago that this company had done some financing and was preparing to resume, but later reports say the boiler and lines have been drained and indications were the well will not resume until spring. The Royal Producers & Royalty Co.'s No. 1, SE NE, Section 27-33-12, on the Red Mesa Terrace, is redrilling at 350 feet after filling back to straighten hole.

In Montrose County, the Uncompahgre Oil & Gas Co.'s No. 1 Colorado, Section 27-50-10, is drilling at 1,300 feet. The objective is expected at 2,500 feet.

Rio Blanco County

In Rio Blanco County, the White Eagle Oil & Refining Co.'s No. 1 Fordham, Section 9-2s-96, is bottomed at 432 feet (corrected) and has the hole cleared except for the 15½-inch bit. Niggerheads dropped into the hole back of the bit and to keep it from going crooked, the cable was cut, letting the tools to the bottom, until the obstructions could be sidetracked.

In Moffat County, the Midwest Refining Co.'s No. 24-SD Parkinson, SE NW, Section 22-4n-92, Iles Dome, is bottomed at 2,380 feet with 1,000 feet of water in the hole and will run the 10-inch. Same company's No. 3-SD Shaw, NE NE, Section 27-4-92, is bottomed in gray sand at 3,078 feet and fishing for underreamer lug. The Alliance Oil Co.'s No. 1 Milliken, SW cor., Section 14-4-92, is fishing for tools at 3,775 feet. Thomas McLaughlin and others' No. 1 Williams, NW SW, Section 2-3n-92, is shut down to finish rigging up after spudding. W. F. McCormick and others' No. 1 Sales, SE SE, Section 28-4-92, is preparing to sidetrack broken stem at a total depth of 2,650 feet, and will run the 10-inch. On the Moffat Dome the Texas Production Co.'s No. 11 Knowlton, SE cor. Section 33-5-91, a rotary test to the Sundance, has been delayed in moving in equipment on account of the heavy conditions of the roads. Considerable moisture without the weather being cold enough to freeze the ground has made the roads almost impassable. One 27,000-pound boiler is on location, but the other of equal weight is still on the road. The same company's No. 5 Walter



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Wick, Section 10-4-92, is cleaning out at 3,034 feet with a total depth of 4,596 feet, and its No. 36 Lloyd, SE cor., Section 21-4-92, Iles Dome, is drilling at 2,345 feet. The Ohio Oil Co.'s No. 1 State, SE cor., Section 16-12-100, Hiawatha Dome, is bottomed at 2,800 feet and underreaming the 4¾-inch.

In Routt County, the Texas Production Co.'s No. 4 Belle Dennis, NE SE, Section 7-6n-86, Tow Creek Dome, rotary test to the Sundance, is bottomed at 3,957 feet and cleaning out at 3,680 feet. The 8¼-inch will be run. Same company's No. 1 State-Oliver, NE NW, Section 18-6-86, is drilling at 3,150 feet, and its No. 5 Henry Dennis, NW cor., Section 17-6-86, is drilling at 2,825 feet.

Utah

The Ashley Valley structure in Uinta County, Utah, west of the Colorado line, attracted attention this week when the Ashley Valley Oil Co.'s No. 1, SE SE, Section 22-5s-22, encountered a flow of gas estimated at 2,000,000 feet, in the Morrison formation at 1,770 feet. It is not yet in the Morrison sand which yielded heavy flows of gas in two tests drilled higher on the structure by the Midwest interests and the Utah Oil Refining Co. The new well is on the downthrow side of a fault running between it and the two wells drilled on the top and it is hoped the oil has been trapped in this fault block. The Sundance contained water in the test on the upthrow side of the fault.

Cane Creek Dome

On the Cane Creek Dome in Grand County, the Utah Southern Oil Co.'s No. 1-A J. L. Shaffer, Section 36-26-20, joint with the Moab Consolidated Oil Co. is drilling at 2,410 feet in black shale. Sandy lime and salt were cut at 2,370-85 feet. From 2,385 to 2,407 feet the bit was in brown sandy lime and shale with considerable sand and carrying water which filled the hole. This horizon seems to correspond with the horizon at 2,025 feet where oil was encountered in the Frank L. Shafer No. 1, a half a mile to the south. In the Frank Shafer well water was encountered which filled the hole a few feet above the point where oil was struck. Same company's No. 1 King, Section 13-23-20, Salt Valley Dome, is drilling in salt at 2,755 feet. It has had practically continuous salt since 1,565 feet. From 1,015 to 1,565 feet the drill penetrated anhydrite beds which were probably a part of the salt beds.

Uinta County

The Utah Southern's No. 1 Farnsworth, Section 29-4s-1e, Pleasant Valley structure in Uinta County, a Tertiary test, is drilling at 1,250 feet in gray shale. The Diamond Oil Co.'s No. 3, Section 29-8s-5e, Buskirk Dome, Utah County, is drilling at 1,643 feet in hard lime and making slow progress on account of the hard formation. The Continental Oil Co.'s No. 1 Boundary Butte, Section 23-43-22, San Juan County, is still fishing at a total depth of 4,305 feet. The Phillips Petroleum Co.'s No. 1 Shick, Section 16-27-16, Barrier Creek structure, Wayne County, is bottomed at 3,840 feet and making boiler repairs. The Utah-Pennsylvania Oil Co.'s No. 1, Section 3-10n-4w, Penrose structure, Box Elder County, is drilling below 1,500 feet in hard lime and carrying the 10-inch. The Big Six Oil Co.'s No. 1 Randall, Section 10-22-19, Crescent Dome in Grand County, is fishing for bit at total depth of 2,710 feet with hole full of water. J. F. Walker has commenced spudding in a test being drilled with a small outfit in the C SE, Section 18-2n-1e, Unita County. The surface is saturated Jurassic. The Maude Ellen Oil Co.'s No. 1, Section 28-3s-21e, Neal Dome, Uinta County, is shut down at 1,330 feet in red and blue shale. Water is flowing between the 8 and 10-inch casings. In Washington County, the Mid-American Oil Co.'s No. 1, Section 17-43-15, Bloomington Dome, is shut down at 1,970 feet, and the St. George Oil Co.'s No. 1 Hiatt, Section 30-43-14, Beehive Dome, is shut down at 668 feet.

Wyoming

Wyoming reported three completions this week of which two were producers and one dry. The Wyoming Associated Oil Co.'s No. 6, SW Section 24-40-79, was completed in the first Wall Creek sand at 1,111 feet in Salt Creek with a production of 69 bbls., and the same company's No. 18-SD-2, SW Section 24-40-79, was deepened into the Sundance sand at 2,765 feet and completed with a production of 225 bbls. The other was the Carter Oil Co.'s test to the lower sands in the NE NW, Section 20-48-82, on the Billy Creek structure in Johnson County. Sand in the Dakota series at 3,872-97 feet was dry, showing neither oil, water or gas, and was abandoned. This was a joint operation with the Consolidated Royalty Oil Co. and the Western Exploration Co. These interests have a developed gas production of 200,000,000 feet on this structure in the Wall Creek sands, the wells being shut in for lack of a market. The well just completed was on the western flank of the structure and approximately 300 feet lower than some of the gas wells on top. It is considered probable a fault intervenes.

The Sinclair Pipe Line Co. has completed the draining of its line from Wyoming to a point in Missouri near Kansas City after running the government royalty oil on hand. Only caretakers are in charge. The future of the line is not disclosed. It is reported that a recent offer to buy the line to convey gas to eastern cities was rejected.

Oregon Basin

In the Oregon Basin Field in Park County, reports were current that the Continental Oil Co.'s No. 1-A State, NW cor., Section 16-51-100, was showing some water. This well was completed last July at 3,803 feet and made 950 bbls. initial. It is understood the water intrusion is not as important as rumors indicated. The well is on the eastern flank of the neck connecting the two domes and was considered in doubtful territory. The fact that it came in as a large producer was something of a surprise. Tests for water have been made at intervals almost from the time the well was completed and the quantity showing is said to be not very large. Farther to the north some water has been showing in the Cody Petroleum wells on the west side of the neck, and also in the Wisconsin Holding Co.'s well on the east side of the neck. The Ohio Oil Co.'s No. 1 Sonners, Account 3, SE Section 8-51-100, is drilling at 1,630 feet and the Wyoming Western Oil Co.'s No. 3 Hough, SE SE, Section 18-51-100, is drilling at 2,175 feet. The Producers & Refiners Corp. is starting another well in this field in Section 29-52-100, farther to the north than its one producing well. The rig is being built. The Cody Petroleum Co.'s No. 1 Garner, SW cor. NE, Section 27-51-101, on the west side, is bailing at 2,810 feet, and its No. 5 Klindt, NE cor., Section 7-51-100, is drilling at 3,704 feet. Same company's No. 6 Klindt, NE NE, Section 7-51-100, is drilling at 2,310 feet. The Big Horn Petroleum Co.'s No. 1 Hoodoo, SE SE, Section 26-51-101, is drilling at 4,310 feet and getting rather deep. The Enalpac Oil & Gas Co.'s No. 2 Cactus, SE cor., Section 6-51-100, is drilling at 275 feet. Outside of Oregon Basin, the Oregon-Wyoming Oil & Gas Co.'s No. 1, Section 30-52-101, Horse Center structure, is drilling at 1,025 feet, and the Producers & Refiners Corp.'s No. 1, on the Sage Creek, or South Frannie Dome, is drilling at 800 feet in slate. The California Exploration Co.'s No. 2, NW NE, Section 14-48-102, has commenced spudding and is down 120 feet in a 22-inch hole. This is joint with the Producers & Refiners' No. 1 hole being lost and the rig skidded. The Ohio Oil Co. is still having casing trouble with its No. 1 Pulley, Section 27-52-101, on the Shoshone anticline, and has not yet drilled into the sand. It is bottomed in the top of the Embar at 4,752 feet and was showing 2,000 feet of oil.

In Big Horn County, the Prairie Oil & Gas Co.'s No. 1 Chilcote, Section 35-56-93, on the Little Sheep Mountain Dome, is drilling at 635 feet, and the Texas Production Co.'s No. 1, Section 23-45-100, Skelton Dome, in Hot Springs County, has overcome the quicksand trouble and is drilling at 68 feet in shale.

Eastern Wyoming

In eastern Wyoming the only drilling of importance is the Buck Creek Oil Co.'s No. 1 Schurich, SW NW, Section 5-35-65, Lance Creek Field, which is being deepened after being on production for 10 months. It is drilling at 3,100 feet and had a little gas at 3,084 feet.

In the central part of the State the Producers & Refiners Corp. is drilling two wells on the Sand Draw structure in Fremont County which were shut down for some time. Its No. 2, Section 9-32-95, has not made any new hole, but is cleaning out at 3,550 feet. Total depth is 3,642 feet. Its No. 7, SW NW, Section 14-32-95, is making new hole and is drilling at 2,850 feet in shale.

In the southern area, the Union Oil Co. of California's No. 1 Herrick, Section 1-16-76, is drilling at 785 feet.

In Carbon County, the Producers & Refiners Corp.'s No. 3, Section 2-19-88, on the Hatfield Dome, is bottomed at 4,003 feet and still cleaning the hole. So far it has pulled 1,760 feet of the 4¾-inch casing. The same company's No. 1, Section 14-25-89, on the Sherrard Dome, is bottomed at 2,372 feet, and is moving back the boilers in anticipation of encountering a gas flow. It had 10,000,000 feet of gas at 2,091 feet which was bradenheaded off. The same company's No. 7, Section 7-26-89, on the Wertz Dome, is bottomed in sand at 3,497 feet where a flow of gas was killed until the casing could be run. The 8¼-inch is at 3,490 feet. Its No. 8, in the NE cor. NW of the same section, is bottomed at 3,718 feet and underreaming for the 9-inch outside diameter casing at 3,520 feet.

Sweetwater County

In Sweetwater County, the Ohio Oil Co.'s No. 1 Humphreys, SW cor., Section 2-12-101, Canon Creek Dome, is drilling at 890 feet, and the Prairie Oil & Gas Co.'s No. 74-A, Section 11-26-90, in the Lost Soldier Field, is straightening hole at 896 feet. The Prairie's No. 1 Tucker, Section 18-13-99, Alkali Butte structure, is jarring on the 8¼-inch casing at 237 feet. Previous report gave the depth at 2,165 feet. The Producers & Refiners' No. 1, NE SE, Section 26-20-104, North Baxter Basin, joint with the Marland Production Co., which plugged back to test gas, is making new hole at 3,500 feet in gray shale and is drilling towards the Sundance. Same company's No. 1, NE cor., Section 26-17-104, South Baxter Basin, is shut down at 145 feet on account of the snow storm.

In Sublet County, the California Petroleum Co. has four wells drilling on the La Barge structure. No. 7-SD, Section 3-26-113, is drilling at 572 feet, and No. 3-E, Section 34-27-113, is drilling at 897 feet. No. 3-B-2, Section 27-27-113, is drilling at 1,323 feet, and No. 3-D, Section 3-26-113, is waiting for 4¾-inch casing at 1,010 feet. The California Co.'s No. 1 Bushell, SW SE, Section 11-29-115, on the Snyder Basin Dome, is drilling at 2,001 feet, and same company's No. 1 Wyss, Section 12-32-115, South Cottonwood Dome, is bottomed at 1,010 feet and sidetracking bit.

In Lincoln County, the Midwest Refining Co.'s No. 1, Section 35-22-115, Waterfall structure, is still cleaning out at 1,765 feet, and piling material close to the rig in anticipation of the heavy snows which fall in that area in the winter.

In Uinta County, the California Co.'s No. 1 Union Pacific, Section 7-17-116, Muddy Creek Dome, is drilling at 2,006 feet in hard gray sandy lime.

Montana

Bids for the sale of Cat Creek royalty oil will be opened by the Interior Department on January 2. This announcement was made by Secretary West. The contract will go into effect February 1, 1929 and will extend over a period of three years. The government royalty oil from the Cat Creek Field amounts to approximately 30,000 bbls. a year.

The Maple Leaf refinery of Canada is reported to have contracted the production of the Dakota-Montana Oil Co. in the Kevin-Sunburst Field at a price of $1.95 a barrel, 20 cents above the price of $1.75 posted by the Ohio Oil Co. for the field. The International refinery has been paying a 10-cent bonus for months while other smaller refineries have offered a 15-cent bonus with crude hard to obtain. There has been strong competition for Kevin-Sunburst crude for a year or more.

Pondera Field

The Midwest Refining Co., which recently acquired the extensive holdings of the Montana Pacific Oil Co. in the heart of the Pondera Field, has started on an intensive development program in that district. Locations have been made for four wells, located respectively on Sections 15-27-4, 14-27-4, 16-27-4 and 10-27-4. The well on Section 16 will offset the No. 3 Fulton State which is making 250 bbls. and is one of the best producers in the field. Two of these four tests have spudded and a third is about ready to drill. It is reported in Great Falls that the Midwest will drill 20 wells in the Pondera Field in the immediate future.

Four wells were completed in Pondera this week: California Petroleum Co.'s No. 7 Kingsbury on the SW Section 15-27-4; Ponting-Rice-Copley's Nos. 4 and 5 on the SE Section 15-27-4; and Continental Development Co.'s No. 2 Wheeler on the SW Section 14-27-4. There are nine wells on the verge of completion in the Pondera Field and about 30 drilling or rigging up.

Kevin-Sunburst

Production figures for the Kevin-Sunburst Field, made public this week, show a decrease in daily production for October compared with September, credited to a slackening in drilling operations. During the past week two gas wells were reported in the Kevin-Sunburst Field, the Climax Natural Gas Co. (formerly the Northern Natural Gas Development Co.) registering one gasser and the Cosmos Petroleum the other. The Ferdig interests completed a 40-bbl. well on the Anderson lease in Section 29-35-1. The Diamond McCormick No. 13 has been shot but not tested. The Marias River-Zachor No. 5, which was shot and failed to produce commercially, was drilled deeper, and late reports put production at several hundred barrels. This report has not been confirmed.

ROCKY MOUNTAIN PRODUCTION
Runs From Field Week Ended November 24

WYOMING	
Salt Creek	35,330
Big Muddy	2,610
Grass Creek	2,290
Elk Basin	1,020
Ferris	20
Rock River	2,530
Lance Creek	360
La Barge	1,860
Poison Spider	1,240
Oregon Basin	4,340
Osage	490
Mule Creek	740
Lander	550
Byron	40
Lost Soldier	3,630
Simpson Ridge	110
Dutton Creek	50
Rex Lake	170
Hamilton Dome	720
Greybull	10
Total Wyoming	58,110
MONTANA	
Cat Creek	1,520
Lake Basin	70
Kevin-Sunburst	7,960
Pondera	2,000
Total Montana	11,550
COLORADO	
Florence	1,201
Moffat	1,264
Fort Collins	2,292
Iles Dome	1,683
Rangely	100
Tow Creek	514
Boulder	25
Walden	53
Total Colorado	7,132
NEW MEXICO	
Rattlesnake	892
Hogback	500
Artesia	1,065
Cap Rock	187
Table Mesa	241
Total New Mexico	2,885
Total Rocky Mountain	79,677

PENNSYLVANIA MARKETS

OIL CITY, Pa. Nov. 24.—A brisk upturn for cylinder stocks with greatly increased demand was the feature of the Pennsylvania refined market during the week. Gasoline was slightly weaker than it was a week ago with the prices reduced to some extent. Demand for motor fuel was fair. Kerosene was moving in less quantity than during the previous week. Fuel oil was unchanged but refiners are looking for a strengthening of it during the coming week. The movement of cylinder stocks was excellent and prices increased greatly. Wax was in good condition. Neutrals were quiet.

Phenomenal Growth of California Field

Greater Part of the State's Oil Production Has Been Obtained in the Past 10 Years. Wells Are Noted for Longevity of Output

By L. P. Stockman

Although the discovery of oil in California dates back almost to the Drake well, which was finished in 1859, the greater part of California's total production to date has been recorded during the past 10 years. Of the 2,955,417,843 bbls. of crude produced up to the present time, 1,811,597,418 bbls. have been brought to the surface during the past decade. California's largest annual production was attained in 1923, when a total of 263,728,895 bbls. were produced. This outstanding record reflects the simultaneous development of Santa Fe Springs, Huntington Beach and Long Beach, this trio being credited with 79,781,275 bbls., 34,355,642 bbls. and 68,810,361 bbls., respectively. It is interesting to note in this connection that Long Beach has been the outstanding factor in California production during 1928 and Santa Fe Springs is destined to lead the parade during 1929 due to deep-zone development already well under way. State production has been consistently in excess of 600,000 bbls. daily since the early part of 1923, notwithstanding a substantial artificial curtailment, and it is quite likely that California will maintain this record during 1929.

Field—	Date of discovery	Total prod. to date	Proven acreage	Recovery per acre	No. prod. wells	Ave. No. wells per acre
Kern River	1899	269,679,952	9,000	29,964	1,167	8
Mount Poso	1926	82,066	1,500	55	4	375
Fruitvale	1928	30,200	500	60	2	250
Round Mountain	1927	46,131	750	62	2	375
McKittrick	1898	76,822,971	2,100	36,582	288	7
Midway-Sunset	1900	637,415,706	45,000	14,165	2,539	18
Elk Hills	1919	99,927,092	5,000	19,985	207	24
Lost Hills-Belridge	1910	58,305,352	4,600	12,675	307	15
Coalinga	1896	308,282,221	16,500	18,684	789	21
Wheeler Ridge	1923	1,814,754	225	8,065	34	7
Watsonville	1880	1,233,388	100	12,334	7	14
Santa Maria	1902	123,090,488	8,250	14,920	227	36
Summerland	1894	2,719,052	150	18,127	89	2
Elwood-Goleta	1927	281,964	250	1,128	4	63
Rincon	1927	679,133	50	13,583	20	2
Ventura Avenue	1912	57,955,518	1,750	33,117	130	13
Ventura-Newhall	1870	43,178,802	4,000	10,795	517	8
Los Angeles-Salt Lake	1894	61,858,185	1,500	41,229	325	5
Whittier	1912	13,361,813	700	19,088	170	4
Fullerton (Brea Olinda)	1897	126,571,915	1,800	70,323	379	5
Coyote	1912	114,962,901	2,150	53,471	210	10
Santa Fe Springs	1921	179,309,168	1,800	99,616	293	6
Montebello	1917	79,133,891	1,500	52,756	170	9
Richfield	1919	53,625,387	1,500	35,750	267	6
Huntington Beach	1920	141,890,306	2,800	50,675	566	5
Long Beach	1921	305,031,906	1,750	174,304	800	2
Torrance	1922	57,781,121	5,000	11,556	618	8
Dominguez	1923	37,302,494	1,000	37,302	73	14
Rosecrans	1924	19,308,754	500	38,618	109	4
Inglewood	1924	56,712,675	900	63,014	220	4
Newport	1900	86,482	100	865	2	50
Seal Beach-Alamitos	1926	26,855,711	1,250	21,484	134	9
Potrero	1927	70,344	100	703	1	100
Total		2,955,417,843	124,075		10,670	

The oil industry in California has registered a phenomenal growth during the past decade and this expansion will undoubtedly continue as the normal demand for refined products has shown a consistent increase year after year. Wildcat exploration and development work in proven fields have been especially conspicuous during this period and this activity has been reflected in the discovery of numerous fields and the production of large quantities of crude oil and natural gas. Twenty new fields have been opened up in California during the past 10 years, three of which made their initial appearance since January 1, 1928. The Standard and Union started the ball rolling in 1919 when the former opened up the Elk Hills Field of Kern County and the latter completed its discovery well in the Richfield district, located in Los Angeles Basin. Only one new field, Huntington Beach, made its advent in 1920. This discovery was an epoch, however, as it was the forerunner of one of the most remarkable development campaigns ever undertaken. Exploration work was stimulated to a very appreciable extent and within a few short years eight major fields were opened up in Los Angeles Basin. The Union Oil Co. opened up the Santa Fe Springs Field late in 1921 after a long tedious 14-year search and the Shell followed suit by bringing in No. 1 Alamitos, the discovery well at Long Beach.

Other Active Periods

Only one new field was chalked up in 1922. This was the Torrance area discovered by the Chanslor-Canfield Midway Oil Co. late in the year. Wildcatters made up for lost time in 1923, however, when the Standard opened up Wheeler Ridge and the Union Oil Co. put Dominguez on the map. The Union and Barnsdall successfully pioneered the Rosecrans Field of Los Angeles Basin in 1924 and the Standard followed this up by bringing in the discovery well at Inglewood. Another temporary lull took place in 1925 but in 1926 the Shell Oil Co. discovered the Mount Poso Field of Kern County and the Marland Oil Co. made a successful strike at Seal Beach. The following year, 1927, was marked by a number of successes in widely separated areas throughout the State. The Associated revealed the existence of commercial production in the Potrero Field of Los Angeles Basin and the Elbe Oil & Land Co. followed suit by opening up the Round Mountain Field of Kern County. Along the seacoast, E. J. Miley secured temporary commercial production in the Goleta area of Santa Barbara County and the Pan American followed a short time later by opening up the Rincon Field in Ventura County, located approximately 30 miles southeast of the former district.

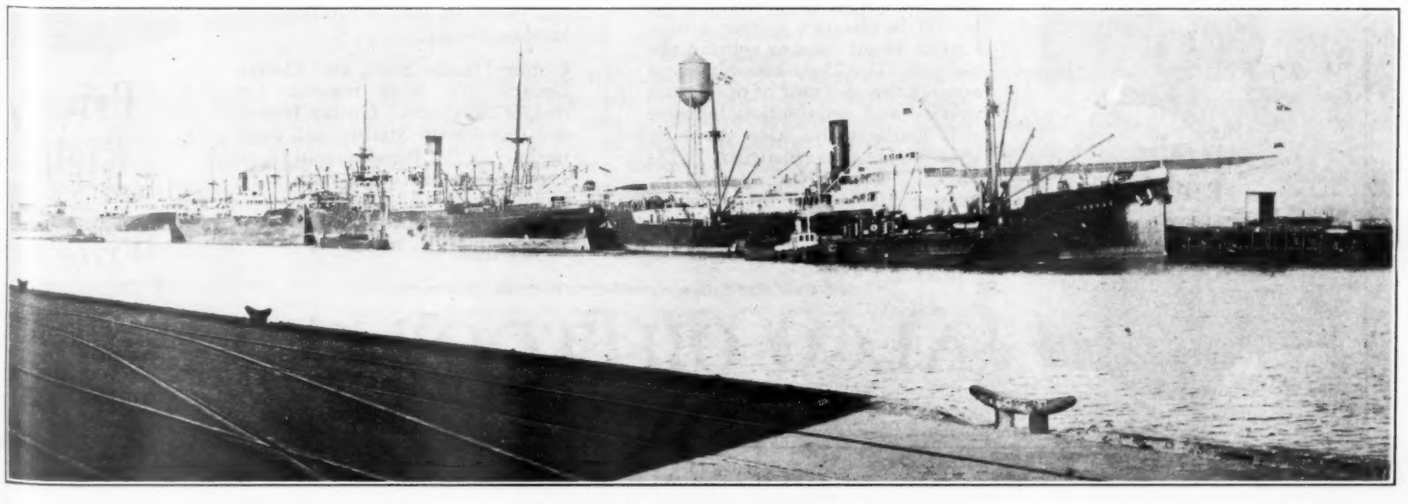
Although 1928 has not yet drawn to a close two new fields have already made their appearance in production reports. These are the Fruitvale Field of Kern County, opened up by the Pacific Eastern Production Co., and the Elwood Field of Santa Barbara County, which stands to the credit of the Barnsdall Oil Co. Another probable new field was opened up in Los Angeles Basin a few months ago when the San Clemente Oil Co. finished a relatively small producer in the Lawndale area, located northeast of Torrance and west of Rosecrans. The initial completion in this district is only yielding small production, approximately 125 bbls. per dry, and consequently this district has not yet been segregated in production reports. The oil is of an exceptionally high grade and, while the Lawndale production is being temporarily grouped with Rosecrans, it will be segregated as soon as the initial discovery has been confirmed by the completion of a second commercial producer.

The Kettleman Hills area of Kern County will probably also be listed as a separate entity before the current year draws to a close as the Milham Exploration Co.'s No. 1 Elliott has revealed the presence of an enormous quantity of natural petroleum gas and the existence of an unusually high quality refining crude. This well blew in out of control on October 5 doing approximately 25,000,000 feet of exceptionally wet gas and about 500 bbls. of 50.0 gravity oil daily. The oil from this well yields 63 per cent gasoline, 26 per cent kerosene and 11 per cent light fuel oil. It contains more paraffin than any other oil produced in California and will no doubt command a premium because of the large number of lighter fractions. An unique driving test was made several days ago when one of the field men drained the gasoline tank of a well-known make of automobile and substituted oil from the Milham's No. 1 Elliott, which, of course, had previously been filtered.

Wells Maintain Production

The longevity of California wells is a matter of common knowledge and naturally a source of personal gratification to producers in general because this long lived production is synonymous with consistent maximum economic yield which, to the financial world, means the greatest return per dollar of capital invested. This longevous production is not limited to any particular area, for practically every major field in California has shown a large recovery per acre and a very favorable production per well. California has produced 2,955,417,843 bbls. of crude since the discovery of oil many years ago and the rapid strides made in production technique have added several hundred million barrels to what a few years ago was thought to be the maximum ultimate recovery. The vast amount of potential oil land in the San Joaquin and Ventura Basins will undoubtedly play a very important part in future production and it is not improbable that California will more than double its present production to date before exhaustion as conservative work and improved methods of production, consisting of gas storage, repressuring operations and a general utilization of the gas lift will increase the expectancy of present producing fields and result in a larger ultimate recovery from new areas as yet undiscovered.

The statement just made that California might produce another 3,000,000 bbls. of crude before the advent of uneconomic production or depletion may probably be challenged by some as this is merely a matter of personal opinion at the present time. It is a matter of common knowledge that there is approximately 1,000,000,000 bbls. of oil in sight at the present time and the discovery of another few fields like Midway-Sunset, Kern River, Coalinga and Long Beach could easily change the future outlook as this quartet alone has produced 1,520,409,785 bbls. since discovery and are still



Inner harbor activities, Los Angeles.

"If It's An ALCO Tool It's Modern"

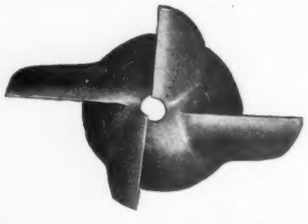
The Alco Quality

Demountable Cutter Head

Complete Bit Assembly

U. S. Patent Numbers 1577875 and 1439972

End View



The Alco Hard Formation Bit

The Alco Hard Formation Bit is fully patented. It was the original two-step drilling bit and has been on the market since March, 1924. It is designed to drill fast and smooth. It is simple in construction, the pilot blades cutting about two-thirds of the hole. The reaming blades are opposite and above the pilot blades forming a two-step hole. The circulation hole is drilled off center sufficiently to prevent cutting a core and plugging which makes the bit operate smoothly and with the minimum of vibration.

It is very successful in drilling in both hard and soft formation. When it breaks through a shell it keeps on drilling, giving a decided advantage over other types of rock bits.

These bits are inserted with Borium and faced with Stellite and make the straightest hole of any bit on the market today. The position of the pilot blades (out ahead of the rest of the bit) practically eliminates rolling and does away with most of the underreaming. Instead of following the soft streaks this bit cuts right through any formation making a straighter hole.

There are two types of the Alco Hard Formation Bit. The rigid type for California Rental Service, and the Demountable Type for the Mid-Continent and Foreign Operator.

With the Demountable Type the Cutter Head may be discarded when worn and replaced with a new one quickly and economically. It is cheaper to use a new Cutter Head than to rebuild the old one. The Demountable Type assures the operator of maximum results and satisfaction because it is made in the Alco shops by specialists, thus insuring PERFECT BALANCE and the proper placing of the Borium, which is so essential to the success of the bit.

The Alco Rotary Core Drill

—*The Newest and Best*—

The newest addition to the Alco line is Alco Coring Service. We are now placing our own core bit on the market and servicing it. It is of two-piece design, consisting of two tubes, one within the other, the inner tube being for the purpose of protecting the core after it has been cut, and between which tubes the circulating mud fluid passes to the bottom of the hole. The two tubes are connected at the bottom by a Cutter Body, on the bottom of which is screwed a Cutter-Head. The cutting surfaces are exceptionally hard and durable.

Two Piece

The Alco Core Drill is manufactured in a size for every well. It takes a core of formation from 1¼ to 4 inches in diameter, and in lengths varying with the hardness of the formation penetrated. It will make more hole than a well tempered fish-tail bit before becoming dull. Its reaming teeth give sufficient clearance so that it can be used to core continuously without reaming.

By means of standard upper connections the Alco Core Drill can be attached to the usual sizes of drill pipe. Our drills give satisfactory results under every known condition in rotary drilling, from the softest sands to the hardest limes.

Cutter Heads, Subs, and Cutter Bodies are heat treated for proper hardness. Cutter Heads are faced with Stellite and tempered. A Bit Breaker and Core Pusher are included with each Core Drill at the list price. These tools are essential to satisfactory operation.

Priced Right

Write for Literature

Mid-Continent Salesmanager—J. C. Hillman, Houston, Texas

ALCO OIL TOOL CO.

Box A, Compton, California

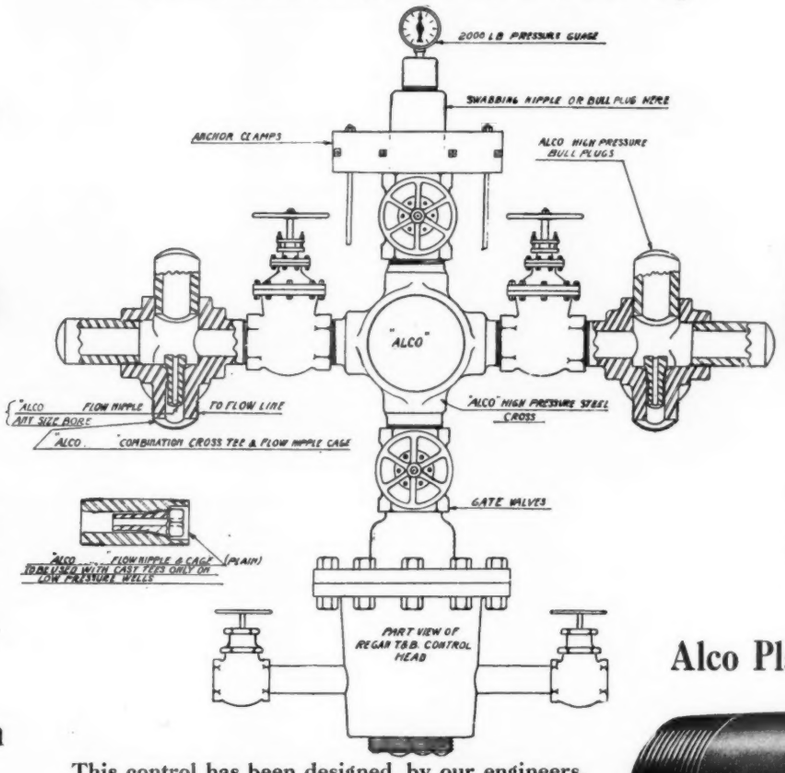
"If It's An ALCO Tool It's Modern"

ALCO Tools Are Simple And Efficient

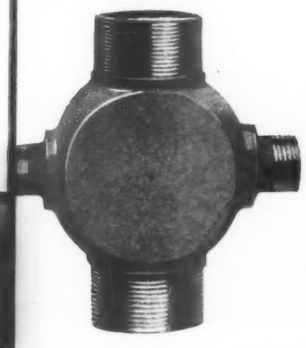
OIL WELL ALCO TOOLS TRADEMARK REG.

Line Of Oil Tools

Alco Christmas Tree Hook Up


2000 LB PRESSURE GUAGE
SWABBING NIPPLE OR BULL PLUG HERE
ANCHOR CLAMPS
ALCO HIGH PRESSURE BULL PLUGS
"ALCO"
"ALCO" FLOW NIPPLE ART SIZE BORE
TO FLOW LINE
"ALCO" HIGH PRESSURE STEEL CROSS
ALCO "COMBINATION CROSS TEE & FLOW NIPPLE CAGE
GATE VALVES
ALCO FLOW NIPPLE & CAGE (PLAIN) TO BE USED WITH CAST TEES ONLY ON LOW PRESSURE WELLS
PART VIEW OF REGAN T&B CONTROL HEAD

Forged Steel Crosses

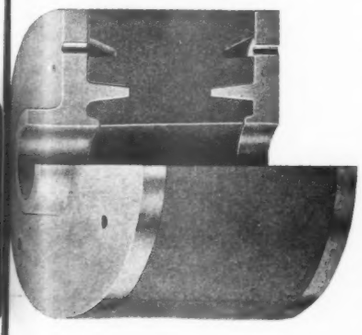


Both standard and special types are made from selected steel forgings, the quality of steel most adapted for a given purpose being used. When ordering give size of male or female thread.

Combination Flow Bean Cage

This type of cage is made for high pressure wells. It is not necessary to use high pressure tees with this cage.

Alco Pump Piston



This control has been designed, by our engineers, to withstand the heavy pressure encountered at deep horizons. It successfully solves the problem of securing a control that will withstand the heavy gas pressure which at times exceeds 1,000 pounds to the square inch. It also withstands the acute corrosive and abrasive action caused by the sand being forced through the hook up under such a pressure. This control is used successfully all over the world by the largest to the smallest oil companies, and, to the best of our knowledge, without the loss of a single well. Patent No. 1559061.

The Alco Solid Rubber Slush Pump Piston gives amazingly long life because of a new principle of construction—it's self-expanding. Pressure of the slush, entering through three ports in the follower plates, constantly expands the lips of each end of the piston, and positively seals them against leakage of fluid. Even when these pistons are worn, the expansion keeps them tight. The tight-fitting lips wipe the liner free of slush on every stroke, thereby preventing wear on the liner. There are no small parts to replace or cause trouble.

Alco Plain Type Cage

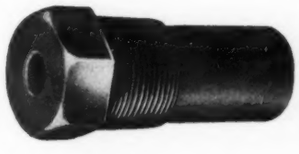
This type of cage is used with female three-way Steel Tees. All Alco high pressure connections are made of solid steel unless otherwise specified. Patent No. 1559061.

Alco Packing Set

The ideal set for packing rods. Easily installed in 5 minutes. Do not have to cut rods. Cheaper and lasts longer.

Alco Flow Bean

Fits plain type and combination cages. All beans are interchangeable. Eliminates union breaks. Beans are changed by simply removing the bull plug. Patent No. 1559061. Insist on the original marked with the Alco stamp.



Mid-Continent Salesmanager—J. C. Hillman, Houston, Texas

ALCO OIL TOOL CO.

Box A, Compton, California

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going strong. Midway-Sunset, which in reality is two separate fields containing a number of minor and major structures, has yielded 637,415,706 bbls. of crude during its existence to date. This field is producing 74,000 bbls. per day at the present time and has a potential daily output of 94,000 bbls. in as much as approximately 20,000 bbls. per day is standing shut in at present as a result of the recent conservation movement undertaken. There is considerable undrilled acreage and it is quite probable that lower zones may eventually be picked up, in which event the production of this field may approach 1,000,000,000 bbls.

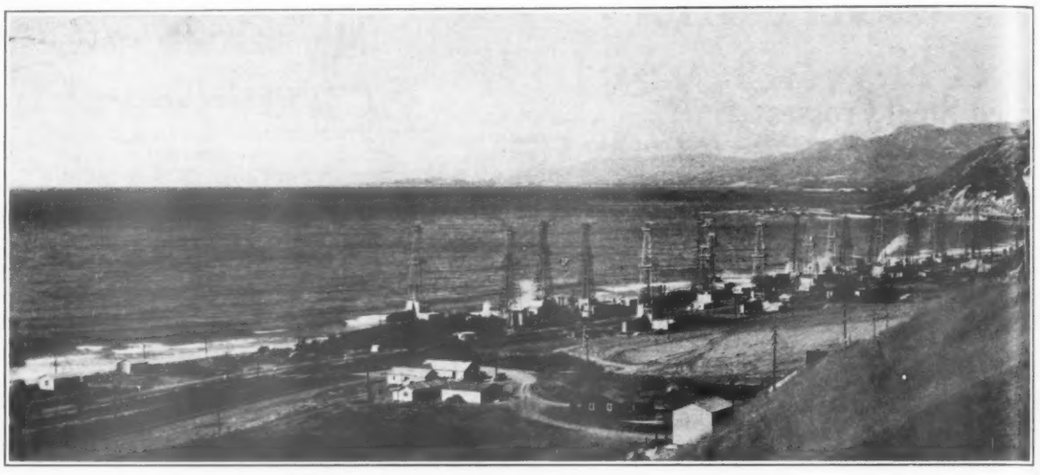
Midway-Sunset in Lead

Although Midway-Sunset has yielded the largest recovery of crude oil to date, Coalinga, Long Beach, Kern River, Santa Fe Springs, Huntington Beach, Brea Olinda, Santa Maria and other fields have shown favorable production. Kern River, one of the oldest fields in California, has produced 269,679,952 bbls. of crude since being opened up and while its life span to date of over 29 years is indicative of longevity there is still a considerable amount of oil yet to be recovered. Long Beach, in contrast to Kern River, is only of comparatively recent origin, having been discovered by the Shell late in 1921, but it has nevertheless shown a larger yield than Kern River and will probably pass Coalinga's recovery to date of 308,282,221 bbls. well within the next 30 days. Long Beach, with its production of 305,031,906 bbls. of crude during the past five years, is expected to produce in excess of 55,000,000 bbls. during 1928 due to deep-sand exploitation and, although none of the other prolific fields of Los Angeles Basin have equaled the output of this area, several of them have deep zones which have not yet been developed. Dominguez, Seal Beach, Inglewood, Rosecrans, Richfield and Coyote will all show greatly increased production when the deep zones in these fields are opened up for work.

The big parade has already started at Santa Fe Springs and the deep Buckbee zone is expected to exert a very appreciable affect on State production during the next six months as the intensive development campaign now well under way should result in the completion of numerous new highly prolific wells. The engineering subcommittee appointed several weeks ago by Santa Fe Springs operators recently completed a minute survey of deep-zone possibilities and it was unanimously agreed that the Buckbee horizon would probably reach a peak in excess of 300,000 bbls. of crude oil and 287,000,000 feet of natural gas daily early in 1929. There is very little likelihood, however, that the output of this deep zone will ever approach this figure as operators are already considering the advisability of curtailing or prorating crude oil production simultaneous with the conservation of natural gas which should be well under way within the next 60 days. Regulation of deep-zone production at Santa Fe Springs will preclude the possible attainment of a high flush peak as this restriction will spread production out over a period of several months. The extent and total thickness of the deep Buckbee zone has not yet been definitely determined although several wells indicate that it should be rather extensive in scope and highly productive. The top of this sand is picked up at approximately 5,600 feet on the apex of the structure and if geological conditions in this field are comparable with those at Long Beach the deep zone at Santa Fe Springs may extend down to below 8,000 feet.

Deep-Sand Production

The possibility that production may be secured down to at least this depth is predicted on the belief that the deep Buckbee zone at Santa Fe Springs corresponds with the Brown zone at Long Beach. The deep prolific production encountered in the Miocene below the 5,500-foot level in the latter field supports the theory that there is either still another productive zone below the Buckbee at Santa Fe Springs or that this horizon is extremely thick. A new producing zone has just been discovered above the Buckbee sand and this intermediate zone, which lies between the Meyer and Buckbee horizons, has a known thickness in excess of 350 feet on top of the structure. It will probably be designated in the future as the Nordstrom zone as it was first found in George F. Getty's No. 17 Nordstrum which blew in as a wild gasser on September 16. It is not yet possible to estimate the probable ultimate production of the Potrero Field as only one successful completion has been finished up to the present time. Potrero, which is located on the Newport-Beverly Sheer zone approximately midway between the Rosecrans and Inglewood Fields, resulted from scientific exploration work by the Associated Oil Co. The limited amount of development work undertaken up to the present time indicates the probable existence of two producing horizons and while the productive area appears to be rather limited in extent subsequent work may change the outlook. The oil produced in the Potrero Field is of an exceptionally high quality, averaging approximately 44.9 degrees A.P.I.



Rincon Field, Ventura County.

Ventura Avenue District

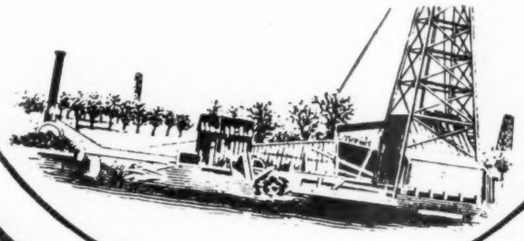
The principal field in Ventura County is the prolific Ventura Avenue district, located about 2 miles north of the city of Ventura. The initial production was secured in the Ventura Avenue Field back in 1916 but this district did not attain prominence until 1922 and did not become an important factor in State production until 1925, when the annual production approximated 6,999,403 bbls. The productive area is a little over 3 miles in length and the field is situated in the center of the major Ventura anticline which extends westward and plunges out into the Pacific Ocean. The Rincon Field is located on the western extremity of the Ventura Avenue anticline at the point where it plunges out into the open ocean. A total of 24 wells have been completed in the Rincon Field since discovery but the total aggregate crude oil production up to the present time is only 679,133 bbls. This represents a total average production of 28,297 bbls. per well and is the equivalent of 27,000 bbls. per acre. Several shallow zones have been encountered and developed up to the present time but none of them is of major consequence. The location of this field on the western extremity of the Ventura anticline caused operators to plunge recklessly into an unwarranted development campaign several months ago as many geologists anticipated the existence of deep prolific production similar to that encountered in the Ventura Avenue Field, located 5 miles to the east. Several deep tests have been started in the Rincon Field but work was subsequently suspended on all of these projects except one. This was the Richfield Oil Co.'s No. 1 Hobson, which recently set a string of 6⅝-inch preparatory to testing out an oil sand of undetermined importance encountered between 6,440 feet and 6,519 feet. This well should definitely determine the possibility of deep production at Rincon as it is favorably located. If a deep prolific zone is not found at Rincon this will be one of the few California oil fields which have failed to yield substantial production over a long period of time.

Scene in Midway-Sunset oil fields, Kern County.

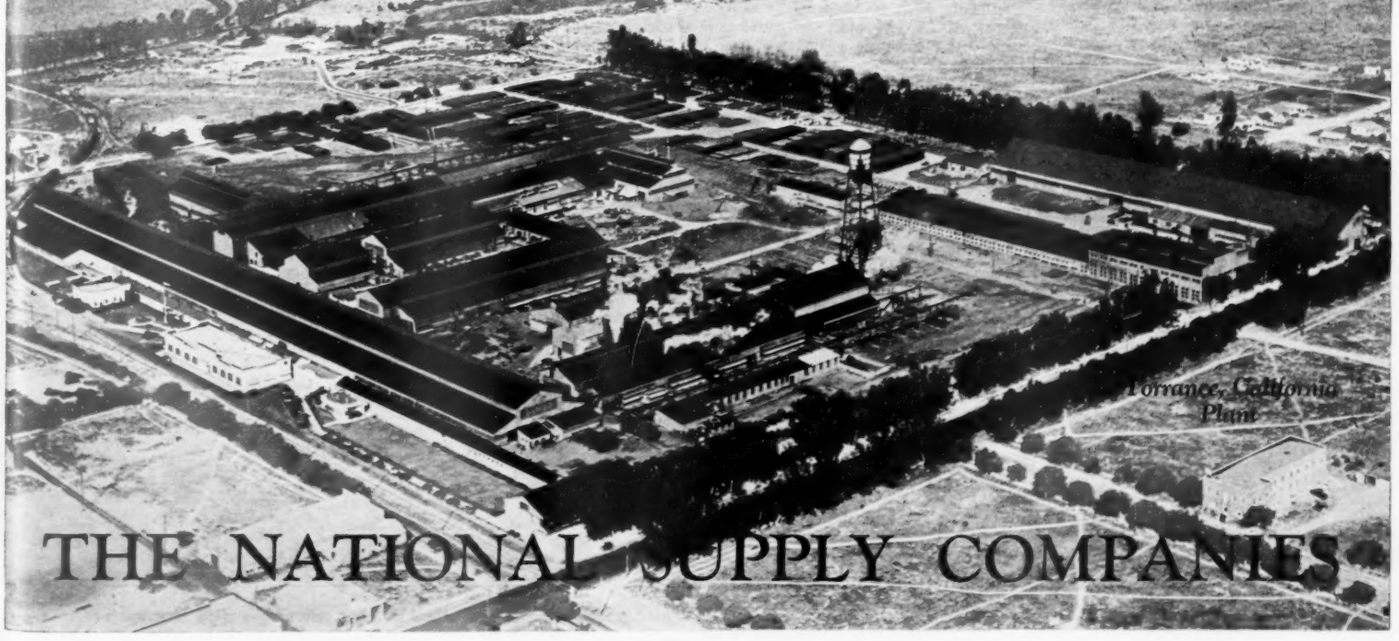
A Typical California Store

NSCo

As California's Oil Industry Grows ...*So Grows* The "NATIONAL"



THE NATIONAL SUPPLY COMPANIES' faith in California's Oil Industry is a matter of long standing. To keep in step with the industry's development; to fore-see its equipment requirements, and to fulfill much of its supply needs called for the constant growth of our California facilities. ¶ That we have complied, and complied whole-heartedly, is evidenced by our maintaining *more* stores in California than any other supply company and by operating there the *largest* oil tool manufacturing plant in the far west. ¶ These facts make it only natural for the equipment painted blue, and called IDEAL, to be so much in evidence in the California fields. It is California made, to meet California conditions, and the experience behind it dates back to 1887. In that year the present Union Tool Division of The National Supply Company of California was founded.



Torrance, California Plant

THE NATIONAL SUPPLY COMPANIES

California Largest Refiner of Crude

Forty-Seven Operating Plants Have Capacity of 827,950 Bbls. Daily. Steady Improvement in Manufacturing Methods

By C. O. Willson

California leads all other states as a refiner of crude oil, a position which it has maintained for several years.

The latest report of the Bureau of Mines shows that in September of this year the reporting refiners ran a total of 18,094,000 bbls. of crude oil to their stills, or an average of 603,133 bbls. daily. Among the states, Texas was California's closest competitor, with a daily average crude oil run to stills of 520,100 bbls.

From these September crude oil runs to still the California refiners secured 5,548,000 bbls. of gasoline, 735,000 bbls. of kerosene, 11,648,000 bbls. of fuel oil and gas oil, 178,000 bbls. of lubricating oil and 59,300 tons of asphalt. For the entire United States the California operators ran 22.6 per cent of the total crude run to stills in the United States. From this crude they secured 16.5 per cent of the total gasoline, 14.6 per cent of the kerosene, 31.4 per cent of the fuel oil and gas oil, 6.3 per cent of the lubricating oils and 19 per cent of the asphalt.

The history of California refining shows that branch of the oil industry has developed in line with the growth of the State as a producer of crude oil. A refinery was built shortly after the first commercial production was discovered, and new plants have been added and expanded as additional crude oil supplies became available. In the early history of the State the refinery output was not sufficient to take care of the State's consumption requirements and supplies were obtained from the eastern refiners. This condition gradually changed until a situation obtained in which the California refiners were able to supply not only the State of California, but all the states of the West Coast, including the western coast of Canada and Alaska.

In recent years, expansion has reached the point where California refiners have become a factor in world markets. This is particularly true since 1923 when a large increase in crude oil production was accompanied by similar expansion in refining facilities until it was necessary to move the California refined products to practically all the important consuming centers. During the past year California gasoline and kerosene found its way to many foreign markets which previously had been served exclusively from other refining areas.

Operating Refineries

As listed in the accompanying tables there are at present 47 operating refineries in California with two small plants in Washington. One of the latter secures its crude supplies from California, where the same company operates three refineries. The California refineries vary in size from the small skimming or topping plant with a daily capacity of a few hundred barrels daily, to the two large complete plants of the Standard Oil Co. of California, each of which has a rated capacity of 100,000 bbls. daily. In addition to the operating refineries, there are about 20 shut-down plants. These plants without exception have a relatively small capacity, and in most cases have been shut down for several years. During the overproduction period of 1923 and 1924 in California oil operations, a large number of small skimming and topping plants were built. In many instances, these plants were shut down with the return of normal conditions, and operations have not as yet been resumed.

Type of Operations

The types of operation in California reflect conditions which are largely peculiar to that State so far as the refining industry is concerned. These conditions are changing and at a few refineries the processing methods very closely resemble those found in the eastern states.

The early trend in California refining was toward large crude-oil capacity with a minimum of processing. This was partially due to the nature of the crude oil supply. Compared to the high-gravity crudes of the Mid-Continent and Eastern fields, the California crudes are of low gravity. Some high-gravity production has been obtained during the past few years, but a majority of refiners are still operating with the heavier crudes, a situation which is reflected in the fact that the percentage of gasoline recovery is lower than any other area.

The chemical characteristics of the crude oil were an additional handicap to the California refiners. The bulk of the crude oil has an asphaltic base with objectionable sulphur compounds. These conditions did not lend themselves to intricate refinery processing for the purpose of securing the maximum yields of marketable products. As a result, the California refining industry until recent years was content to secure small yields of gasoline, kerosene and distillates as overhead products, leaving the bulk of the crude oil as a residuum to be sold as fuel oil.

The fact that the West Coast was long distant from cheap coal supplies abetted this manufacturing condition, the refiners having a wide and profitable market for their fuel oil. With the overproduction of 1923 and 1924 conditions in regard to fuel oil changed. Excessive supplies have lowered fuel oil prices and refiners have been forced to seek distant markets in disposing of their refinery output.

This has been a factor in bringing about a greater interest in cracking and other equipment designed to meet the special requirements of the West Coast refiners so that the past five years have witnessed rapid strides in the modernization of plant operations. The operators have found that it is possible to obtain from their raw material most of the products secured from crudes in other sections of the country.

Of particular interest are the claims as to the superiority of California gasoline. It is no secret in marketing circles that California gasoline, both in the United States and in foreign countries, often commands premium prices, due to its superiority as an antiknock motor fuel.

The basic character of the crude oil, which was formerly considered so objectionable, is now a recognized asset in the manufacture of both straightrun and cracked gasoline. The asphalt base of the raw crude when properly refined assures the maximum content of desirable naphthenic hydrocarbons in the finished gasoline. Distributors have been able to capitalize on this fact not only in the West Coast states but in many of the eastern states as well as foreign markets. The California gasoline is now quite extensively used by eastern refiners in blend-

OPERATING REFINERIES IN CALIFORNIA

Company and plant location—	Daily crude oil capacity	Type of plant	Daily cracking capacity	Type of cracking plant
Associated Oil Co., Avon	60,000	S&L	.....	
Associated Oil Co., Watson	10,000	S	.....	
Associated Oil Co., Taft	1,500	S	.....	
Brownmoor Oil Co., Long Beach	3,500	S	.....	
Dominion Oil Co., Roadmite	750	S	.....	
General Petroleum Corp., Lebec	12,000	S	.....	
General Petroleum Corp., Vernon	55,000	Comp.	.....	
General Petroleum Corp., Olinda	3,000	S	.....	
Gilmore Oil Co., Vernon	8,000	S	.....	
Gilmore Oil Co., Los Angeles	4,000	S	.....	
Hancock Oil Co., Long Beach	7,500	S	.....	
Hercules Gasoline Co., Los Angeles	5,000	S	2,000	Jenkins
Lakeview Oil Refining Co., Maricopa	2,500	S	.....	
MacMillan Petroleum Products Co., Long Beach	6,000	S	.....	
Marine Refining Corp., Los Angeles	10,000	S	.....	
Olympic Refining Co., Burnett	5,000	S	.....	
Pan American Petroleum Co., Watson*	70,000	Comp.	10,000	Black
Paraffine Companies, Inc., Emeryville	1,200	S	.....	
Pioneer Paper Co., Los Angeles	500	A	.....	
Richfield Oil Co., Bakersfield	3,500	S	.....	
Richfield Oil Co., Los Angeles	3,500	S	.....	
Richfield Oil Co., Rioco	45,000	S&C	12,500	Cross
Rio Grande Oil Co., Vindale	5,000	S	4,000	Jenkins
Seaboard Petroleum Corp., Los Angeles	2,000	S	.....	
Seaside Oil Co., Summerland	2,000	A	.....	
Seaside Oil Co., Ventura	3,000	S	.....	
St. Helens Petroleum Co., Ltd., Whittier	10,000	S	.....	
Shell Co. of California, Dominguez	35,000	S	17,500	Dubbs
Shell Co. of California, Martinez	33,000	Comp.	9,000	Dubbs
Shell Co. of California, Watson	35,000	Comp.	8,000	Dubbs
Standard Oil Co. of California, Richmond	100,000	Comp.	17,500	Dubbs
Standard Oil Co. of California, El Segundo	100,000	Comp.	24,000	Dubbs
Standard Oil Co. of California, Bakersfield	25,000	S&A	.....	
The Texas Company of California, Watson	30,000	Comp.	2,000	Holmes-Manly
The Texas Company of California, Fillmore	5,000	Comp.	.....	
The Texas Company of California, Coalinga	3,000	S	.....	
Union Oil Co., Avila	10,000	S	.....	
Union Oil Co., Brea	5,000	S	.....	
Union Oil Co., Los Angeles	50,000	S&A	10,000	Cross
Union Oil Co., Oleum	28,000	SA&L	.....	
Union Oil Co., Santa Paula	1,000	S	.....	
Union Oil Co., Maltha	3,000	S	.....	
Vernon Oil Refining Co., Los Angeles	3,000	S	.....	
Western Oil & Refining Co., Wilmington	10,000	S&C	†4,000	Jenkins
Wilshire Oil Co., Inc., Vernon	10,000	S	.....	
Wilshire Oil Co., Inc., Fellows	2,500	S	.....	
Total	827,950		121,000	

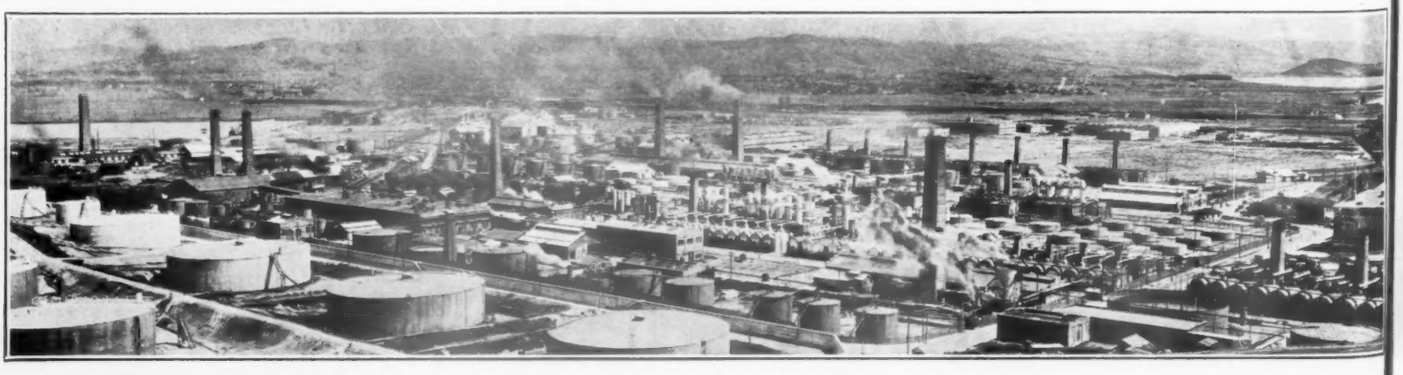
WASHINGTON REFINERIES

Spokane Oil & Refining Co., Spokane	4,000	S	.....	
The Texas Company of California, Seattle	1,000	S	.....	
Total	5,000			

*Merged with Richfield Oil Co. †Owned by Process Construction Co.

ABBREVIATIONS USED IN TABLE

Complete plant (Comp.)—Gasoline, kerosene, gas and fuel oils, lubricating oils, paraffin wax, petroleum coke, asphalt or both coke and asphalt, usually includes cracking.
Skimming plant (S)—Gasoline, kerosene, gas and fuel oils.
Skimming and lub (S&L)—Gasoline, kerosene, gas and fuel oils, lubricating oils.
Skimming and asphalt (S&A)—Gasoline, kerosene, gas and fuel oils, asphalt.
Skimming, lub and asphalt (SL&A)—Gasoline, kerosene, gas and fuel oils, lubricating oils, asphalt.
Lub plant (L)—Gas and fuel oils, lubricating oils.
Asphalt plant (A)—Distillates, gas and fuel oils, asphalt.
Cracking (C)—Same products as skimming.



The Richmond refinery of the Standard Oil Co. of California, which is the northern terminal of that company's pipe line system.

ing to secure the necessary antiknock rating in motor fuels.

As one phase of this development, there has been a steady advance in the quantity of cracked gasoline refined in California during the past three or four years. Government figures show that in 1925 cracked gasoline represented .57 per cent of the total supply available from California refiners. In 1926 this ratio increased to 2.51 per cent; 1927, 6.27 per cent, and in September of this year the ratio was 8 per cent.

This percentage is still much less than the 34 per cent average of cracked gasoline for the refining industry in this country, but it shows that a start has been made with a continued expansion to be expected in the future. Formerly, cracking at the California refineries was confined to experimental units which usually failed when attempts were made to commercialize the operation.

It was found that the life of equipment was short, due to corrosion, and treating costs were high, due to the presence of sulphur compounds. As in other refining areas, these manufacturing difficulties have been gradually overcome, and the cracking operation is becoming more and more attractive.

Somewhat the same situation has applied to kerosene, special engine distillate and lubricating oil. Substantial yields of kerosene and distillate are now being obtained from crude oils which previously only yielded gasoline as a light end product. This has been brought about by improved fractionating equipment, coupled with a large amount of research work in treating.

A few of the larger refiners are perfecting methods for the extraction of the lubricating oil fractions from California crude oils. The production of lubricating oils in California jumped from 336,600 bbls. in 1923 to 2,313,000 bbls. in 1927. Certain grades, such as bright stocks, are not made commercially by the western refiners, but finished motor oils are now being manufactured and sold in competition with oils obtained from refiners in other areas. Some of the neutral grades have a wide demand in foreign markets. Petroleum wax is not manufactured by the California refiners, due to the lack of paraffin-base crudes.

A large supply of crude oil suitable for the manufacture of several grades of asphalt are available in California, and this is one of the important products obtained by refiners. Distillates for tractors, Diesel oils and other special products for the western trade are now obtained from refineries located in those areas.

Distribution of Products

As previously stated, the products of California refineries are now sold in all parts of the world. The so-called normal marketing area is confined to five western states, western Canada and Alaska, with exports outlets to the Orient. This market has enlarged so that for the past five years California gasoline and fuel oil have been very important factors in the markets of the East Coast and Gulf Coast states. The relatively short water haul through the Panama Canal made this situation possible. In a combination water and rail movement California gasoline has often been sold as far inland as Chicago and Detroit.

During the past two years California gasoline has been sold in substantial quantities in the European markets. With the improvement in refinery processing resulting in larger yields of light end products, it is certain that California will increase in importance as a factor in world markets.

The five states which depend on California refiners for practically all of their gasoline are Arizona, Oregon, Washington, Nevada and California. Based on reports made in connection with the collection of state gasoline taxes, these states consumed the following quantities of gasoline (data given in barrels):

State—	Consumption first 6 mos. 1928
Arizona	637,000
Oregon	1,503,000
Washington	2,443,000
Nevada	151,000
California	12,774,000
Total	17,504,000

The above figures do not include deductions allowed for evaporation between the refineries and consumers' tanks. The consumption of the five states is little over 50 per cent of the total production of gasoline by California refineries for the same period.

Government Survey

The Bureau of Mines recently completed a survey showing the distribution of the principal refined products from California refineries. This survey shows that out of a total production of 57,510,149 bbls. of gasoline and engine distillate, 34,003,427, or 59.13 per cent, were accounted for in domestic deliveries and the remaining 23,506,722 bbls. in shipments.

Of these total shipments of 23,506,722 bbls., 11,050,240 bbls., or 19.21 per cent, were shipped to foreign countries; 781,457, or 1.36 per cent, to Alaska, Hawaii and Canal Zone; and 11,675,025 bbls., or 20.3 per cent, to Atlantic and Gulf Coast ports.

Kerosene Consumption

The indicated 1927 kerosene consumption from California refineries totaled 5,465,773 bbls. Of this quantity, 3,818,882 bbls. were exported, 230,048 bbls. to Alaska, Hawaii and Canal Zone, 73,835 bbls. intercoastal, with an indicated domestic consumption of 1,343,008 bbls. China and other Asiatic countries are large buyers of California kerosene.

Lubricating Oils

With a total demand for lubricating oils of 2,311,824 bbls. in 1927, 501,838 bbls. were exported, 63,308 bbls. to Alaska, Hawaii and Canal Zone, 355,347 bbls. to intercoastal trade, with an indicated domestic consumption of 1,291,331 bbls.

The asphalt demand for 1927 totaled 525,387 tons. Exports totaled 87,085 bbls., with an indicated domestic consumption of 429,665 bbls.

Refinery Pipe Lines

The Standard Oil Co. of California, the largest producer and marketer on the West Coast, has three refineries, one at El Segundo in southern California, another at Bakersfield in the San Joaquin Valley, and a third at Richmond just outside of Oakland. As a rule, this company does not store oil in its crude state, but has adopted the policy of either topping or refining it as soon as practicable and storing in the form of gasoline, kerosene, fuel oil, etc. The company's tank farms are generally located in close proximity to the three refineries, although of course considerable storage facilities are maintained at other points throughout the State.

The Standard's principal concentration points are at El Segundo, Coyote, Kern River, Midway, Pond, Los Mendanos and San Pablo, although each pumping station has one or more storage tanks in addition to the necessary working space. The Standard is running more pipe line oil in southern California than its El Segundo refinery requires, and as a result a considerable part is being interchanged or moved northward by tankers to its Richmond refinery. The company's tanker fleet played a very important part in the handling of the overproduction situation in 1923 and 1924, as no inconsiderable amount of oil was moved from Los Angeles harbor to Richmond, alleviating the storage situation in southern California. The company has 48 reservoirs just outside of Bakersfield, many of which were empty at that time, but by topping the oil moved from Los Angeles to Richmond, the pipe line department was able to utilize this available storage by reversing the usual operation of pumping from Kern to Richmond.

Union Refineries

The Union Oil Co. has refineries at Wilmington, Kern River, Oleum and Santa Paula. The refinery at Oleum is running on crude produced both in Southern California and in the San Joaquin Valley, the company's tanker fleet playing a very important part in transporting oil from Wilmington and Port San Luis to these points. The Union's refineries have a normal running capacity of 80,000 bbls. of crude daily. The Oleum refinery, near San Francisco, which handles 28,000 bbls. of crude daily, produces refined oils, all the company's lubricants and greases, and most of the asphalts. The bulk of Union gasoline is produced at the Los Angeles refinery at Wilmington, which has an operating capacity of 50,000 bbls. of oil daily.

Shell Refiners

The Shell Co. has three refineries in California, one at Watson and another at Dominguez near Los Angeles harbor, with a daily capacity of 35,000 bbls. each, and another at Martinez on Suisun Bay, 30 miles outside of Oakland, which is rated at 33,000 bbls. daily. The Watson and Dominguez plants are running on southern California oil, while that at Martinez is operating on oil produced in both the San Joaquin Valley and in fields located in the southern part of the State. In addition to these plants, the company has a topping plant in operation at Coalinga in Fresno County. The Shell's principal storage points are at Watson, Martinez and Coalinga, all three points being pipe line terminals. The Associated has refineries at Watson in southern California and at Avon and Martinez in the northern part of the State, in addition to a 1,500-bbl. topping plant at Taft in the San Joaquin Valley. The Martinez and Avon refineries are operating on production originating principally at Ventura and in the fields of San Joaquin Valley, while the refinery at Wilmington is running on southern California crude. The Associated's main storage is at Watson, Avon and Kern River, pipe lines connecting these points with the refineries operated.

The Richfield Oil Co.'s refinery, which is at Rioco, just outside of Long Beach, is being operated in conjunction with a skimming plant at Huntington Beach and a skimming and asphalt plant at Bakersfield in Kern County. In the acquisition of the Pan American the Richfield acquired perhaps the most modern refinery in the State, located at Watson, near Los Angeles harbor, at which point is also situated the company's principal tank farm. This refinery is operating on crude produced in both southern California and in the San Joaquin Valley, the oil from the latter point being moved to Watson via its 10-inch welded line extending from Taft to Los Angeles, passing over the Tehachapi Mountains en route.

The General Petroleum Corp.'s refinery is at Vernon, near Los Angeles, although the company has skimming plants at Lebec, Maricopa and Olinda, and recently broke ground for a new modern plant to be located at Lomita. The company's Vernon plant, which will be dismantled and moved to Lomita, is operating on both crude produced in southern California and the San Joaquin Valley. Oil from the latter area is transported to Los Angeles through the company's pipe line system extending from Lost Hills to Vernon and thence to Wilmington. The Texas Company has refineries at Fillmore in Ventura County, Watson in southern California, and Seattle, Wash. Several topping plants, located at Coalinga, Taft, San Francisco and Santa Fe Springs, are also operated by the company.

Bird's-eye view of Ventura Avenue Field.

California Expects Many New Fields

Believes That Extraordinary Progress in Discovery of Past Decade May Be Equaled During the Coming 10 Years

Exploration work in California has been very successful during the past 10 years, and although a number of major fields were opened up during this decade, the next 10 years should prove equally as productive. Los Angeles Basin has passed its maximum development from an exploration standpoint, and while a new field may be found from time to time, the greater part of its future production must of necessity result from deep drilling and extensive work in proven fields. In addition to Long Beach and Santa Fe Springs, where deep zones are already under development, lower productive horizons are actually known to exist in the Richfield, Coyote, Seal Beach, Potrero, Rosecrans, Dominguez and Inglewood Fields. The flush production from these deep zones should prove a very important factor in future production, and with the advantages accruing from scientific conservation work becoming more evident every day, a more general application of gas storage and repressuring operations may be anticipated. The partial elimination of waste through a more judicious use of natural gas during the past several months is a very progressive step and gas conservation activities will undoubtedly be broadened from time to time in the future.

Although Los Angeles Basin has borne the brunt of exploration and development work during the past 10 years, future activities will center in that vast potential area north of the Tehachapi Mountains and up along the coast line in Ventura and Santa Barbara Counties especially. The numerous prolific fields opened up in Los Angeles Basin during the first major exploration cycle now drawing to a close has had a tendency to concentrate activities within a relatively limited area in Southern California and to divert attention from the northern part of the State which has possibilities comparable with those enjoyed by Los Angeles Basin previous to 1920. The picture is now reversed, however, and the second major development era will be localized for the most part in the San Joaquin Valley, which unquestionably has enormous possibilities. The San Joaquin Valley, which lies north of the Tehachapi range and attains a maximum width of 60 miles across, is a huge elongated basin several times larger than Los Angeles Basin in southern California, which has yielded over 824,262,579 bbls. of crude oil since intensive development work was initiated in 1919. Geologically, the southern San Joaquin Basin is very similar to Los Angeles Basin, although of course it is many times larger in area. Both basins have at their centers organic rocks approximating 5,000 feet in thickness that hold oil. Above these rocks there are others with an aggregate thickness in excess of 5,000 feet which contain soft sands in which the oil collects.

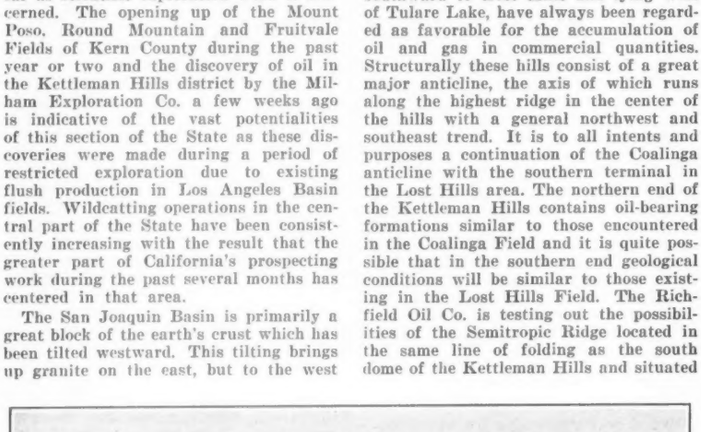
Scientific Wildcatting

Wildcatting operations and exploration work has only reached its present scientific state during the past several years, and prospecting work previous to 1920 was therefore an extremely hazardous undertaking, with the element of luck being a most important factor due to the lack of intensive geological research. Wildcatting is still of course very uncertain, but the mortality rate has been reduced in so far as carefully selected wells are concerned by eliminating exploration work in areas geologically unfavorable. Very little prospecting work has been undertaken in the San Joaquin Valley since 1920 and this area has consequently not yet received the benefits of increased geological knowledge and improved methods of drilling. It is quite obvious, therefore, that this intermittent superficial work will be supplanted during the next several years by an era of aggressive wildcatting based on competent geological advice. It is generally admitted that the major part of California's future production must of necessity come from the San Joaquin Valley area, which, up to the present time, has only been scratched as far as scientific exploration work is concerned. The opening up of the Mount Poso, Round Mountain and Fruitvale Fields of Kern County during the past year or two and the discovery of oil in the Kettleman Hills district by the Milham Exploration Co. a few weeks ago is indicative of the vast potentialities of this section of the State as these discoveries were made during a period of restricted exploration due to existing flush production in Los Angeles Basin fields. Wildcatting operations in the central part of the State have been consistently increasing with the result that the greater part of California's prospecting work during the past several months has centered in that area.

The San Joaquin Basin is primarily a great block of the earth's crust which has been tilted westward. This tilting brings up granite on the east, but to the west sedimentary rocks appear and increase in thickness until far out in the center of the Basin they are thicker than any drill can penetrate at present. This tilting accounts for the prevalence of granitic outcrops east of the Mount Poso and Round Mountain Fields located along the eastern side of the Basin, and although prospectors have nearly always heretofore refrained from wildcatting in areas containing granite for obvious reasons, granitic outcrops are quite evident in these two productive areas. Up to the present time, most of the production secured in the San Joaquin Valley comes from a series of fields extending along the west side of the Basin, beginning with Wheeler Ridge in the south end of the valley and extending northward in an almost unbroken line to Lost Hills, a distance of over 50 miles. The Milham Exploration Co. has just opened up a new field in the Kettleman Hills area located between the Lost Hills and Coalinga Fields, and it is quite possible that the intervening gap will be closed by the discovery of one or more new fields within the next few years. The Milham's well, which has definitely proved up the existence of either a new oil or gas field in the north dome of the Kettleman Hills, blew in out of control a few weeks ago flowing approximately 25,000,000 feet of supersaturated petroleum gas and about 600 bbls. of 50 gravity oil daily.

Kettleman Hills

The Kettleman Hills, which consists of a range of hills running from Coalinga southward to Lost Hills and lying west of Tulare Lake, have always been regarded as favorable for the accumulation of oil and gas in commercial quantities. Structurally these hills consist of a great major anticline, the axis of which runs along the highest ridge in the center of the hills with a general northwest and southeast trend. It is to all intents and purposes a continuation of the Coalinga anticline with the southern terminal in the Lost Hills area. The northern end of the Kettleman Hills contains oil-bearing formations similar to those encountered in the Coalinga Field and it is quite possible that in the southern end geological conditions will be similar to those existing in the Lost Hills Field. The Richfield Oil Co. is testing out the possibilities of the Semitropic Ridge located in the same line of folding as the south dome of the Kettleman Hills and situated about 6 miles southeast. This area has possibilities and should be watched, although it may require a series of wells to locate commercial production.



Oil loading wharf in outer harbor, Los Angeles

Although wildcatters have been prospecting in California for many years, none of them has made determined effort to develop commercial gas production. The Milham Exploration Co., however, realized the possibility of developing gas production, and with this idea in mind an intensive exploration program was initiated in the Buttonwillow district of Kern County. This exploration work resulted in the discovery of a commercial gas field which will undoubtedly become an important factor in the future economic structure on the Pacific Coast. Two productive horizons have been developed by the Milham interests at Buttonwillow, and although this gas is not a petroleum gas, it will compete with the latter to some extent, as it has a favorable B.t.u. content. The Buttonwillow district is located approximately 10 miles northeast of the Elk Hills Field of Kern County. The development of commercial gas production at Buttonwillow is of special significance because of the relative position of this field to the Lost Hills and Elk Hills Fields. There are two strategic possible production intervals between Lost Hills and Elk Hills, and if the Richfield Oil Co. succeeds in discovering a new district at Semitropic this gap will be entirely closed.

Other Counties Favorable

The probability of developing substantial production in Ventura, Santa Barbara and San Luis Obispo Counties is extremely favorable, and consequently a large number of the major operators are either already engaged in exploration work or contemplate an extension of wildcatting activities into these prospective areas. The Ventura Basin is not as large as the San Joaquin Valley, but it contains the thickest oil formations in California and perhaps in the world. The Ventura Avenue Field, one of the most prolific districts opened up in California, has enormous drainage area and thickness of oil sand. It is a part of the major Ventura Basin, and while it has not shown a high substantial flush production, this is due to the conservative manner in which it is being developed. The daily production at Ventura Avenue could be increased to at least 200,000 bbls. by enlarging the scope of work if necessity demanded, but this district will be held back until conditions improve. The enormously high gas oil ratio characteristic of this field has forced operators to pinch in a number of wells in order to increase ultimate crude oil production and to eliminate economic waste resulting from the excessively large production of natural gas. Production is known to exist in the Ventura Avenue Field between 2,250 feet and the 8,000-foot level, there being 5,750 feet of known oil sand all productive except for minor breaks in the upper part. The richest sands have probably already been found, but deeper and somewhat poorer sands of the Sespe (Oligocene) age are productive in nearby fields and may yield oil as deep as 17,000 feet at Ventura Avenue if and when a well can successfully go to that depth. The Rincon Field, located on the extreme western end of the 16-mile Ventura anticline, is another productive area forming a component part of the Ventura Basin, and while this field is still a minor factor as far as major production is concerned, a deep well is now being drilled in an effort to determine the possibility of opening up a deep prolific sand.

Although exploration work during the past 10 years has resulted in the discovery of numerous new fields, wildcatting operations during the next decade should prove equally as successful, although new fields are not expected to show the rapid flush production which has characterized development work in many of the prolific districts opened up in Los Angeles Basin. The sparsely settled San Joaquin Valley precludes the development of town lot areas, and development work in these fields should be along conservative lines. State production during the next year or two should continue at a relatively high rate due to deep zone development in proven fields, and while new fields will undoubtedly be discovered in the San Joaquin Valley and along the coast in Ventura, Santa Barbara and San Luis Obispo Counties during this period, production will be controlled, due to the fact that operators will be developing acreage instead of intensely subdivided town lot areas. The enormous potentialities of the San Joaquin Valley and other virgin areas offer exceptional inducements to prospectors who have the advantage of competent geological advice.

May Drill Even Deeper in California

Recent Geological Discoveries Indicate Probable Existence of Additional Zones Below Present Producing Horizons

By L. P. Stockman

There has been a very marked tendency in California fields especially during the past year to engage in deeper drilling and it is quite likely that considerable work along this line will be undertaken in years to come as recent geological discoveries indicate the probable existence of additional zones below present producing horizons in many fields. The Shell Co. has just climaxed this progressive deep drilling campaign by finishing its No. 3 Wells in the Long Beach Field at 8,087 feet and although it has not yet made a bid for production, core samples prove up the bottom part of the deep zone as worthy of development. This well, incidentally, is expected to give a test within the next day or two and although the outlook is favorable for commercial production, a large well is not anticipated because of the limited thickness of oil sand to be tried out. The Long Beach Field is a little different from the usual run of California fields due to the unusual thickness of almost unbroken oil-bearing formation. In most fields the oil zones are separate and distinct and easily identified but at Long Beach the oil sand below the 5,000-foot level continues almost unbroken to below 8,000 feet, a thickness in excess of 3,000 feet.

During the early part of the current year deep zone wells were being finished around the 6,000-foot level, but progressive drilling soon carried the average completion depth down to 6,500 feet and deep wells have subsequently been coming in anywhere from this point down to 7,500 feet. In most instances operators have taken advantage of the maximum penetration available in the oil sand and oil strings containing in excess of 2,500 feet of perforated pipe have become quite common. The Shell has deviated from the usual practice in No. 3 Wells, however, as this deep well will test out the potentiality of the lower part of the deep zone exclusively. The upper portion of the deep zone has therefore been cased off and with a string of 5¾-inch landed and cemented at 7,845 feet only the bottom 242 feet of oil sand will be tried out. The outcome of this test will be watched with interest because of the assumption by some that the upper part of the deep horizon has become partially depleted and has been thieving a portion of the flush production from the lower part of the zone.

Complete Well Below 8,000 Feet

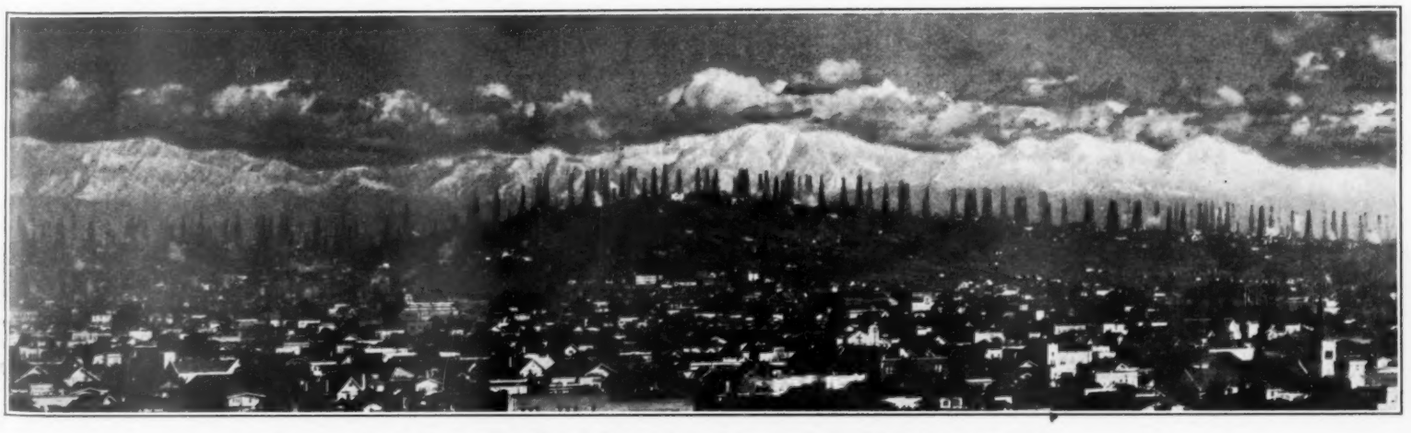
The State Co.'s No. 1 Bradbury, which failed to secure commercial production when given a test from 8,065 feet several weeks ago due partially to mechanical trouble, was the first well in California to be finished in an oil sand below the 8,000-foot level. There are a number of other projects in both the Long Beach and Ventura Avenue fields, however, which may ultimately be finished below the depth of this well. Only one other hole in California, No. 96 Olinda of the Chanslor-Canfield Midway Oil Co., located in the Fullerton or Brea Olinda Field of Orange County, has ever been carried down below the 8,000-foot level up to the present time. This project, however, failed to encounter any deep showings of importance and with its abandonment as a duster it comes under the head of exploratory work. No. 96 Olinda was written off as a dry hole at 8,201 feet. The Associated's No. 100 Lloyd, located in the extreme eastern part of the Ventura Avenue Field, missed the 8,000-foot level by 43 feet when mechanical trouble prevented further work and resulted in its completion on July 30, 1928, as a 1,175-bbl. well from 7,957 feet.

Drilling Below 7,000 Feet

There are 58 wells producing in California from below the 7,000-foot level at the present time, but this number will be substantially augmented in the near future as 21 potential producers at Long Beach and six more at Ventura Avenue are rotating ahead below this point at the present time. The increasing tendency to engage in deeper drilling naturally did not materialize over night although rapid strides have been made especially during the past six or eight months when the greater part of this progressive drilling took place. The veracity of this statement is evidenced by the fact that only one successful commercial producer was finished in California previous to January 8 of the current year. This was E. J. Miley's No. 6 Athens, located in the Rosecrans Field of Los Angeles Basin, which came in under a natural flow doing 1,000 bbls. per day from a depth of 7,591 feet on September 25, 1925. This well failed to hold up, however, and deep drilling did not again become a factor until over two years later. The Shell started the ball rolling again on January 8, 1928, by completing No. 18 Edison in the Ventura Avenue Field doing 3,750 bbls. daily from 7,015 feet. The completion of this well established a state record for deep production but the Shell did not retain this distinction very long as the Associated brought in No. 1 Dabney Lloyd in the same field doing 425 bbls. daily from 7,032 feet a few weeks later. The Shell came back again and carried off deep completion honors by finishing No. 19 Edison doing 990 bbls. daily from an even 7,100 feet on February 8, 1928, only to relinquish this record again when the Associated retaliated by bringing in No. 102 Lloyd doing 3,200 bbls. daily from 7,210 feet on March 14. The General Petroleum entered the picture at this point by carrying No. 2 Hisey down to 7,276 feet and finishing it as a commercial producer on April 6, 1928. The scene was then shifted to Long Beach, where the Richfield Oil Co. brought in No. 6 Dennie on May 6, 1928, flowing 1,475 bbls. per day from 7,401 feet. This record was broken eight days later when the Shell completed No. 1 Brown in the same field on May 14, doing 1,670 bbls. from 7,503 feet. The Associated recovered the deep drilling record by finishing No. 100 Lloyd in the Ventura Avenue Field flowing 1,175 bbls. daily from 7,957 feet on July 30, 1928, only to relinquish it again to the Shell when that company brought in No. 4 fee in the Long Beach Field flowing 1,730 bbls. daily from the 7,988-foot level on October 8 last. The well still reigns supreme although the Shell's No. 3 Wells in the Long Beach Field is expected to supplant it some time within the next few days as it has been finished in an oil sand at 8,087 feet. Ventura Avenue has a somewhat thicker oil bearing formation than Long Beach and it is quite likely that one of the operators in the former field will eventually finish a producing well below any depth attainable in Los Angeles Basin fields. The possibility of Ventura Avenue being ultimately credited with the state's deepest producer is of special significance as not a single well in this field has ever been drilled entirely through the oil zone, notwithstanding the fact that a depth of nearly 8,000 feet has already been attained.

COMPLETE LIST OF DEEP CALIFORNIA PRODUCERS
(Below 7,000 feet)

Company and well number—	Depth	Initial prod.	Date completed and field
C. C. M. O. Co., No. 96 Olinda	8,201	dry	April 15, 1927, Brea Olinda
Shell Co., No. 3 Wells	8,087	cmt.	Oct. 26, 1928, Long Beach
The State Co., No. 1 Bradbury	8,065	cmt.	Oct. 15, 1928, Long Beach
The Shell Co., No. 4 fee	7,988	1,730	Oct. 8, 1928, Long Beach
Associated, No. 100 Lloyd	7,957	1,175	July 30, 1928, Ventura Ave.
Shell Co., No. 5 Nicholson	7,805	1,520	August 8, 1928, Long Beach
Shell Co., No. 6 Goddard	7,793	925	Sept. 27, 1928, Long Beach
Sovereign Oil Co., No. 3 Long Beach	7,743	1,500	Sept. 19, 1928, Long Beach
Miley, No. 6 Athens	7,591	1,000	Sept. 25, 1926, Rosecrans
Jergins Trust, No. 22 Municipal	7,520	1,852	Aug. 1928, Long Beach
Shell Co., No. 1 Brown	7,503	1,670	May 14, 1928, Long Beach
Getty, Geo. F., No. 27 Long Beach	7,474	1,180	Aug. 11, 1928, Long Beach
The Texas Company, No. 4 Moore	7,440	1,740	Sept. 6, 1928, Long Beach
Richfield, No. 6 Dennie	7,401	1,475	May 6, 1928, Long Beach
Shell Co., No. 12 Cresson	7,370	1,940	Oct. 10, 1928, Long Beach
Gen. Pet. Co., No. 2 Signal	7,369	1,260	July 26, 1928, Long Beach
Shell Co., No. 4 Babb-Tucker	7,366	3,295	Aug. 2, 1928, Long Beach
Shell Co., No. 3 Stratton	7,350	340	Aug. 3, 1928, Long Beach
Shell Co., No. 5 Stakemiller	7,350	1,643	Sept. 18, 1928, Long Beach
Calif. Eastern, No. 62 Marine	7,348	875	Aug. 14, 1928, Long Beach
The Pet. Co., No. 3 Rissman	7,337	1,625	July 24, 1928, Long Beach
Shell Co., No. 8 Nesa	7,315	2,690	Oct. 1, 1928, Long Beach
Getty, Geo. F., No. 21 Long Beach	7,311	1,915	July 2, 1928, Long Beach
Shell Co., No. 2 Foster	7,310	1,140	May 20, 1928, Long Beach
Getty, Geo. F., No. 22 Long Beach	7,300	3,150	July 3, 1928, Long Beach
Richfield, No. 2 Union Pacific	7,299	3,465	Sept. 26, 1928, Long Beach
Gen. Pet. Co., No. 2 Hisey	7,276	592	April 6, 1928, Ventura Ave.
The Texas Company, No. 3 Neece	7,272	630	Sept. 24, 1928, Long Beach
Calif. Eastern, No. 63 Marine	7,238	1,720	Sept. 27, 1928, Long Beach
The Texas Co., No. 10 Harlow Kent	7,227	2,455	Sept. 5, 1928, Long Beach
Jergins Trust, No. 23 Municipal	7,223	2,095	July 24, 1928, Long Beach
Shell Co., No. 21 Edison	7,220	2,216	June 18, 1928, Ventura Ave.
Associated, No. 102 Lloyd	7,210	3,200	March 14, 1928, Ventura Ave.
Richfield, No. 8 Dennie	7,210	410	Oct. 3, 1928, Long Beach
The Texas Company, No. 2 Ellis	7,206	770	May 24, 1928, Long Beach
Shell Co., No. 5 Marcellus	7,203	490	Aug. 19, 1928, Long Beach
Shell Co., No. 26 Gosnell	7,195	2,240	Sept. 6, 1928, Ventura Ave.
Rainbow Pet., No. 1 Dutcher	7,195	300	Aug. 20, 1928, Long Beach
Shell Co., No. 16 Edison	7,157	1,755	March 23, 1928, Ventura Ave.
Shell Co., No. 8 Coseboom	7,132	560	Aug. 16, 1928, Long Beach
Shell Co., No. 25 Taylor	7,120	3,090	May 5, 1928, Ventura Ave.
Pet. Securities, No. 4 Orton	7,108	825	Aug. 23, 1928, Ventura Ave.
Shell Co., No. 19 Edison	7,100	990	Feb. 8, 1928, Ventura Ave.
Associated, No. 51 Lloyd	7,100	1,725	March 15, 1928, Ventura Ave.
Shell Co., No. 3 Horsch	7,100	1,430	July 10, 1928, Long Beach
Shell Co., No. 24 Taylor	7,097	2,750	May 10, 1928, Ventura Ave.
Rio Grande, No. 3-A Municipal	7,093	870	Aug. 7, 1928, Long Beach
Shell Co., No. 3 Hamilton	7,086	690	Aug. 4, 1928, Long Beach
Shell Co., No. 11 Gosnell	7,063	860	Sept. 20, 1928, Ventura Ave.
Shell Co., No. 4 Martin	7,060	1,850	April 2, 1928, Long Beach
Gen. Pet. Co., No. 3 Black & Drake	7,046	980	May 28, 1928, Long Beach
Superior, No. 2-A Swaffield	7,040	400	May 14, 1928, Long Beach
Associated, No. 1 Dabney-Lloyd	7,032	425	Jan. 26, 1928, Ventura Ave.
Gen. Pet. Co., No. 8 K. & H.	7,032	1,740	May 9, 1928, Long Beach
Associated, No. 56 Lloyd	7,027	2,340	Oct. 3, 1928, Ventura Ave.
Pet. Securities, No. 3 Willett	7,023	1,650	March 19, 1928, Ventura Ave.
Shell Co., No. 18 Edison	7,015	3,750	Jan. 8, 1928, Ventura Ave.
Shell Co., No. 24 Gosnell	7,000	1,850	April 1, 1928, Ventura Ave.



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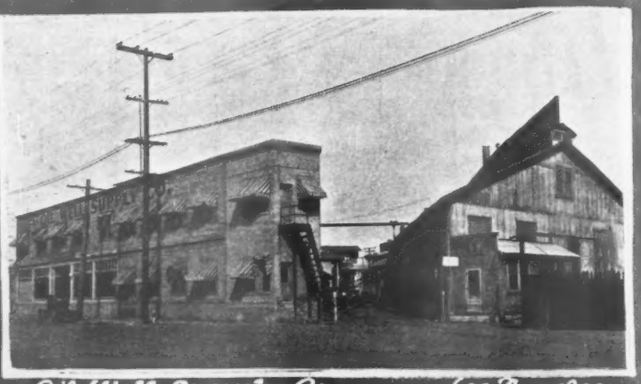

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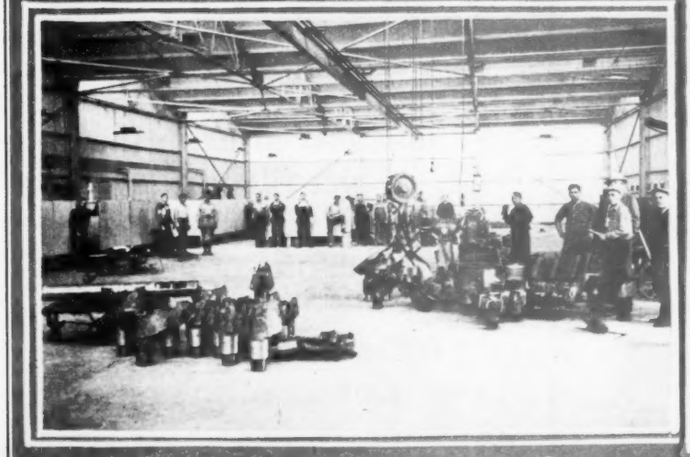
Above Mac Clatchie Mfg. Co.; Compton Left Axelson Mchn. Co. ~ ~ Los Angeles



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California's Own Pipe Line Problems

Topographic and Climatic Difficulties Successfully Overcome. Mountains Form Rugged Barriers Along Several Routes

By L. P. Stockman

Although very little major construction work has been undertaken during the past several years, California has a very complete and comprehensive system of pipe lines which extend from Los Angeles in the south to San Francisco in the north, a distance of about 500 miles. From a mileage standpoint this is rather insignificant compared with some of the major systems of the Mid-Continent, but this factor is offset by the varying topographic and climatic conditions encountered by California pipe lines. The Coast Range Mountains, which parallel the coast line in the western part of the State and the Tehachapi Range, which takes an east and west trend, form natural rugged barriers which have had to be conquered by pipe line contractors during the course of work. Climatic conditions throughout the State show a considerable variation, the change being especially noticeable during the winter when the mountainous areas are snow clad, in contrast to the warmer valleys. Line breaks are especially common in crossing the Techachapi Range particularly when heavy oil from the San Joaquin Valley is being moved southward to Los Angeles.

None of the various marketing companies operating in California has complete state-wide coverage so far as pipe line facilities are concerned, although oil could be moved from Los Angeles northward to San Francisco or vice versa by utilizing two or more systems. Refining centers have naturally been established in the populous areas along the seacoast where marketing and transportation facilities are most favorable, although the Union and Standard both operate refineries in Kern County in order to supply inland communities. The concentration of refining centers and the termination of pipe line facilities at Los Angeles and San Francisco is particularly advantageous as both crude and refined products can be moved by tankers to all parts of the world. Tanker fleets of the various refiners play a very important part in the local market moving crude oil from Los Angeles harbor to San Francisco and transporting refined oil from both areas to other normal domestic markets along the Pacific Coast, extending from Alaska in the north to Mexico, Central and South America in the south.

The greater part of the production north of the Tehachapi Range is moved northward to San Francisco where the Standard, Associated and Shell have refineries. The Pan American and General Petroleum's production in the San Joaquin Valley on the other hand comes south to Los Angeles while the Union's output is transported through its Producers Pipe Line, which extends westward from the producing fields of Kern and Fresno Counties to Port San Luis, an open port on the seacoast in San Luis Obispo County. The concentration of a number of flush fields within a limited area in Los Angeles Basin and the proximity of these areas to refining centers has eliminated the necessity of long trunk lines, but this lack of mileage is more than made up by the numerous and intricate lines which make up a vast net work of major proportions. There are 25 minor and major fields located in this area of concentrated endeavor and oil and gas lines are so numerous in many instances that in tapping them they must be closely traced and distinguished by the use of colored paint. Six, eight and ten lines sometimes parallel one another along highways. This is due to the custom of utilizing public highways instead of securing individual rights of way across private property and is especially noticeable at Long Beach and in the area immediately adjacent to the Watson tank farm district a few miles northeast of Los Angeles harbor.

New Lines

Three new oil lines have been laid in northern California during the current year to date and another is in course of construction. The General Petroleum started off the year by laying a new 6-inch line from the Rincon Field to Ventura Avenue, a distance of about 6 miles where it made connections with the Associated's two 8-inch lines which run from the latter field to tidewater, a distance of approximately 5 miles. The General Petroleum has just added another link to its pipe line facilities by putting the finishing touches on a new 8-inch welded line out of the Mount Poso Field of Kern County. This line extends from the company's Glide lease at Mount Poso to the Young lease on the west front of the Kern River Field, a distance of about 10 miles. The most recent line laid in California was the Associated's new 18-mile pipe line running from its Gaviota refinery to the Elwood Field, which was discovered by the Barnsdall Oil Co. a few months ago. This installation has just been finished and it is likely that the Associated will transport all of the Barnsdall's future production from Elwood to Gaviota where part of it will be loaded into tankers and delivered to the Rio Grande Oil Co. at Los Angeles. The Barnsdall and Rio Grande each has a one-half interest in any production secured at Elwood and while the latter has been shipping Elwood crude to its Vinvale refinery in southern California by tank car for the past few months this rail movement will probably be supplanted by pipe line and tanker shipments in the near future.

Line to Kettleman Hills

The General Petroleum recently started laying a new 6-inch pipe line from the recently discovered Kettleman Hills Field to its existing northern terminal at Lost Hills, a distance of about 25 miles. This line is being rushed to completion and should be running oil within a few days. The Milham Exploration Co.'s discovery well has been deluging the neighborhood with high gravity oil for several weeks and, while it is now under control, it is imperative that the General Petroleum's new line be placed in operation at the earliest possible moment as this oil, about 4,000 bbls. daily, has been accumulating at a rapid rate. Ten tank trucks have been pressed into operation and this fleet has been working 24 hours a day for three weeks in an effort to cope with this flood of oil. It is likely several additional pipe lines will be laid out of this area before another year draws to a close as the Kettleman Hills Field is expected to be over 5 miles in length. The Standard is the largest individual holder of potential oil land at present owning every alternate section of land in fee and has been actively acquiring additional acreage for several weeks. Kettleman Hills is a low range of hills which extend southeasterly from Coalinga in Fresno County to the Lost Hills Field in Kern County, a distance of about 40 miles. There are three separate domes in the Kettleman Hills and if the central and south domes are as productive as the north dome recently opened up for work by the Milham interests considerable pipe line work will become necessary.

Map of oil trunk pipe line system in California.

Replacing Santa Fe Springs Lines

When Santa Fe Springs was hitting on all six back in 1923 pipe line companies were forced to install a relatively large number of both gas and oil lines to cope with the exceedingly high flush production of this prolific field. The period of flush production was short lived, however, and as other fields were subsequently developed excess lines at Santa Fe Springs were removed and laid in other districts. This was done of course before anyone appreciated the possibilities of deep zone production and were unaware of the fact that probably all fields in Los Angeles Basin had deeper horizons than those being exploited at that time. As a result several pipe line companies have been forced to replace previous existing facilities in order to be in a position to handle the anticipated flush production expected to result from deep zone exploitation. Santa Fe Springs established a high of 365,000 bbls. daily on August 20, 1923, and while production will probably never again be allowed to reach this peak, present facilities are totally inadequate to handle even an additional 150,000 bbls. daily.

The Richfield and Standard are both augmenting their pipe line capacity by laying additional lines, and the Union and General Petroleum may also find it necessary to lay at least one more line. A survey was recently made to ascertain whether some of the old natural gas lines could be used to advantage and if this can be done it will eliminate the necessity of additional expenditures. The possibility of using some of these gas lines depends upon the outcome of the repressuring and storage program now under way because if operators are forced to move this natural gas out of the field additional oil lines will have to be laid. It is hoped that proration of production will prove successful and prevent a repetition of the chaotic conditions which existed in 1923. It is imperative that the proposed curtailment in crude oil production be carried to a successful conclusion because it is generally admitted the real prolific deep zone has not yet been reached. This is expected to occur somewhere in the Miocene between 6,500 feet and 8,000 feet and if development proceeds unabated it might literally swamp refiners and pipe line companies. The Industrial Fuel Supply has just put the finishing touches on a new 12-inch gathering line around the field in anticipation of greatly increased production of natural gas and it is expected other concerns will also undertake additional expansion.

Buttonwillow Gas Line

The coming year will probably witness the completion of several major pipe line projects in California as development work is spreading out instead of being confined to a limited area as heretofore. One of the most interesting is the projected gas line to be laid from the Buttonwillow gas field in Kern County to the San Francisco Bay region. The Milham Exploration Co., a subsidiary of the Mexican Seaboard Oil Co., has already finished seven gas wells at Buttonwillow

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and has a potential consistent daily production in excess of 50,000,000 feet daily, which will be available whenever a market is created. Two horizons have been definitely proven up in this field, and while only the upper is being developed at present, the lower will ultimately come into production on a large scale. This is strictly a gas field and while it has oil possibilities no oil sands have been encountered up to the present. Tentative plans for this new gas line to San Francisco were completed several months ago and the Mexican Seaboard Oil Co. closed a distribution contract late in September with the Pacific Gas & Electric Co., whereby the latter will construct and operate this projected 240-mile natural gas line. A new company has accordingly been organized and this concern, the Northern California Gas Co., has been given authority to issue 500,000 shares of common stock with no par value and bonds to the extent of $5,000,000, the net proceeds to be used for construction purposes.

The initial capacity of this projected line will be approximately 50,000,000 feet daily, but its ultimate capacity will be about double that. The Pacific Gas & Electric Co. will own 50 per cent of this new line while the other 50 per cent will be owned jointly by the Southern California Gas Co. and the Pacific Lighting Co. Three long-term contracts have been signed by the Pacific Gas & Electric Co., which will operate the line whereby it agrees to purchase gas from the Milham Exploration Co., the Southern California Gas Co. and the Pacific Lighting Co. This three-way plan will link up the Buttonwillow, Buena Vista Hills, Elk Hills and Taft oil and gas fields. This new natural gas line to San Francisco will undoubtedly be pushed to completion next year as there is now ample gas available to guarantee its operation for a long period. The prolific oil and gas field recently opened up by the Milham interests at Kettleman Hills is especially significant in view of the fact that it is right in line with the tentative route to be followed by this new major gas line. It is also interesting to note that application was recently made to the California Railroad Commission for permission to construct a new gas line from the Ventura Avenue Field northward to Buttonwillow where it will intercept the projected natural gas line to San Francisco. If developments warrant two lines will be laid northward to San Francisco, one on each side of the San Joaquin Valley to supply a number of thriving communities enroute.

Coastal Gas Line

Another gas line of major importance expected to be finished and in operation early next year will take care of the coastal region in Santa Barbara and San Luis Obispo Counties. This project has been under construction for some time and additional crews have recently been put on to facilitate work. When completed it will extend from Santa Barbara to Lompoc and tie in with two arms from the Santa Maria and Elwood Fields which will be the principal source of supply. This line, being built jointly by the Southern Counties Gas Co. and the Santa Maria Gas Co., will follow the new State highway through the San Julian ranch and its first consumer of importance will be the Celite Products plant, which will require in excess of 1,000,000 feet of natural gas daily. It is an 8-inch welded line and will ultimately be hooked up with the Rincon and Ventura Avenue Fields which are about 25 miles southeast of the southern terminal at Santa Barbara.

Conservation work undertaken in California up to the present has affected pipe line operation to a very appreciable extent and in many instances pipe lines have been reversed in order to alleviate surplus production of natural gas in one section of the State by moving this excess into other areas. This is especially true of the Midway Gas Co.'s main trunk extending from the Elk Hills and Buena Vista Hills in Kern County to Los Angeles. This line, built for the purpose of transporting natural gas from the San Joaquin Valley to Los Angeles domestic and commercial markets, is now being utilized for the transportation of southern California and Ventura Avenue natural gas northward. Other smaller lines have also been reversed in order to deliver natural gas to operators for storage and repressuring work. Natural gas lines have been a big factor in the general conservation work undertaken in California during the past year by transporting natural gas from flush fields to areas where it could be stored and used for repressuring.

Natural Gasoline Lines

There is only one major gasoline line in existence in California at present, although there are a number of minor installations averaging around 15 and 20 miles in length. This is the Shell's natural gasoline line which extends from the prolific Ventura Avenue Field to Los Angeles harbor, a distance of slightly less than 100 miles. Crude oil production at Ventura Avenue, in contrast to this casinghead gasoline, is being moved to the various refineries by tankers as no crude oil lines have yet been laid out of this district. For a number of years the Shell moved this natural gasoline to its Wilmington and Martinez refineries in tank cars, but with the large increase in natural gasoline production during the past two years this practice was no longer feasible and it became necessary to devise a means of transporting this volatile product by means of a pipe line. The Shell's natural gasoline plant at Ventura Avenue was up until recently the largest installation in the world, but its capacity of approximately 150,000 gallons daily has been exceeded by the Shell's recently enlarged Long Beach plant which has been running in excess of 160,000 gallons daily for several months. This natural gasoline line in addition to being the largest single installation is perhaps the most unique pipe line in existence as it is operated entirely by automatic control. Its exact length is 99.7 miles, of which 81 miles consist of 4-inch slip joint pipe and 16.7 miles of 6-inch. The line was designed to handle a maximum of 140,000 gallons per day but it has been consistently running 150,000 gallons. This is at the rate of 6,250 gallons per hour or roughly 104 gallons per minute. This 100-mile natural gasoline line was constructed in 33 actual working days at a total cost of a little less than $1,000,000. One of the most remarkable features in connection with this project is that it has paid for itself several times over because of economies effected through the elimination of a 100-mile railroad haul and the reduction of evaporation losses to a minimum.

Control Device

The control device installed in the Shell's automatic pump station at Simi is exceptionally interesting both from an engineering and operating standpoint. It consists of a boiler riveted steel pressure tank attached to which are four float cages. Two of these floats are set to operate a mercury switch which starts and stops the motor automatically, the other two floats being connected to ball-bearing throttle valves, one on the suction line and one on the discharge line. These valves and floats are so set that a constant governable quantity of liquid is kept moving through the automatic Simi pump station at all times. When the Ventura pump shuts down, the Simi pump automatically stops as the entire system is one of liquid level control. This automatic control is also obviously of great value in the event of a line break as it minimizes the possibility of feeding gasoline into a broken pipe line. Extreme care was used in the construction of this line to reduce leakage to a minimum and eliminate pipe line breaks as far as possible. The line was tested hydraulically to 1,000 pounds per square inch after being placed in the trench and with all leaks made absolutely tight, full protection is assured against line breaks and operating difficulties. It was well insulated and is buried from 2 to 4 feet.

There are several other natural gasoline lines in California in addition to the Shell's major installation but they are relatively short. The General Petroleum completed a new 20-mile 3-inch welded line from the Brea Olinda Field to its Vernon refinery several months ago, the Standard having just previously laid a 6-inch welded natural gasoline line from the Rosecrans Field to its refinery at El Segundo, a distance of approximately 10 miles. The Union and Shell are also operating natural gasoline lines out of the Brea district, the former's 6-inch line terminating at San Pedro, 33 miles away, and the Shell's 3-inch line terminating at its Wilmington refinery, about 30 miles from Brea. These lines, in contrast to the Shell's Ventura Wilmington project, are all low pressure installations. Utilization of pipe lines for the transportation of natural gasoline is only of relatively recent origin in California, but this improved method of transportation will undoubtedly become of more importance in the future, especially in view of the industry's desire to eliminate waste.

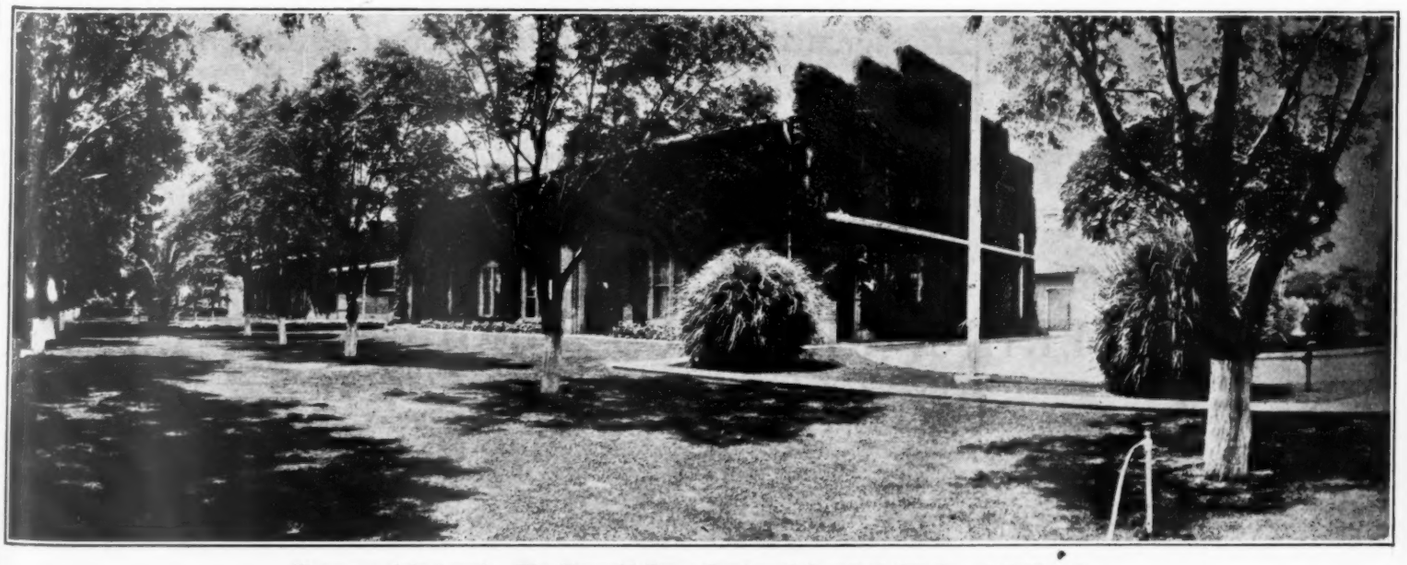
Crude Oil Lines

Crude oil lines in California vary both in size and construction. With the exception of the Pan American's pipe line which extends from the Elk Hills Field in the San Joaquin Valley to Los Angeles harbor all of the major main trunks north of the Tehachapi Range are old in point of service and probably not as efficient as the various systems in use in Los Angeles Basin, where the oil handled is of a much higher gravity. Three major trunk lines have the San Francisco Bay region as their northern terminal. These belong to the Associated, Shell and Standard Oil companies and for many miles parallel one another. The Standard has perhaps the most comprehensive system of lines, and, although the company has no pipe line southward over the Tehachapi Range into Los Angeles, it is nevertheless refining southern California crude oil at its Richmond refinery near San Francisco due to its ability to move this oil efficiently by utilizing its fleet of tankers. The Standard's principal pipe line system in the northern part of the State extends southward from its Richmond refinery to Bakersfield, a distance of about 290 miles. This main trunk is fed by branch lines connecting all of the fields of Kern County while another gathering system connects the Coalinga Field in Fresno County with the trunk line just south of Mendota.

The Associated has two trunk lines extending southward from its Avon refinery at Port Costa which diverge at Arbios, a little distance north of the city of Fresno, one extending down to Kern River and the other over to Taft in the Midway Sunset district. The Kern line affords the company an outlet for oil produced in the Kern River Field, while the Coalinga line, that passing through Coalinga and extending down through Lost Hills, Belridge, McKittrick, Midway-Sunset and Elk Hills, takes care of the production in these areas. The Kern and Coalinga lines are connected with lateral trunks at two points, and operation is quite flexible.

Shell's Pipe Line

The Shell's pipe line extends northward through the San Joaquin Valley from Coalinga in Fresno County to its Martinez refinery at Martinez on San



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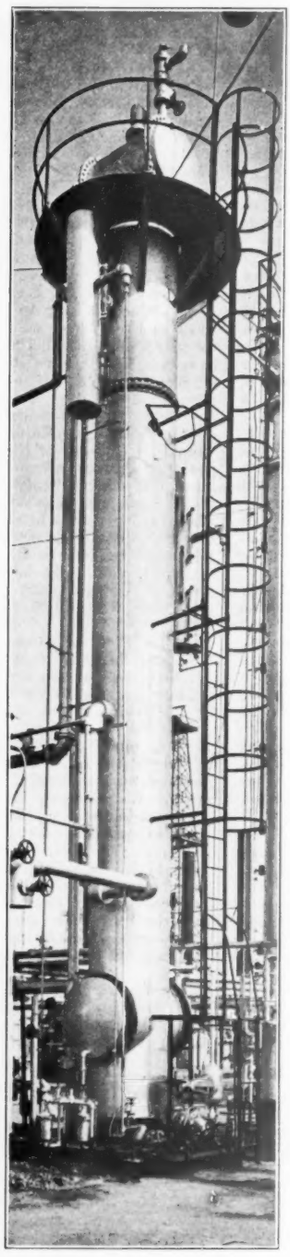

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Pablo Bay, a short distance outside of Oakland. The Shell has been successful in developing favorable commercial production in the Mount Poso and Round Mountain Fields of Kern County during the past two years and the Coalinga Martinez line will ultimately be extended down into Kern County to pick up this production when needed. This projected extension will undoubtedly be routed via the Midway-Sunset Field in order that the company will be in a position to purchase additional oil in the open market if desirable.

The Shell has a very close working agreement with the Honolulu Consolidated Oil Co. which has a daily production in the Midway-Sunset Field of approximately 10,000 bbls. per day, and while the former is purchasing this crude at the present time it is being transported to Coalinga through the lines of another concern. It is likely the former's Coalinga line will soon be extended southward and this oil eventually run direct through the Shell's facilities. It is not definitely known just how soon the Shell will extend the southern terminal of its Coalinga Martinez line, but it would not be at all surprising if this new work was undertaken before 1929 draws to a close. This company has been exceedingly active in the purchase of both productive and potential oil properties in the Midway-Sunset district during the past several months and this may be the forerunner of a general expansion program. The situation at Mount Poso and Round Mountain has delayed the laying of this line for more than a year. The oil produced in these two districts is of a heavy unrefinable grade and it is obvious the Shell does not wish to extend its facilities into these fields any sooner than necessary, especially as it will also be necessary to engage in additional drilling.

Union Company Line

Production and purchases of the Union Oil Co. in the San Joaquin Valley are taken care of by an adequate pipe line system which is practically an 8-inch line for its entire length. From Port San Luis there are two 8-inch lines running up through San Luis Obispo, Santa Margarita, Creston, Shandon and Antelope to Junction, at which point an 8-inch line leaves the system northward passing through Dudley and Tar Canyon and on up to the Coalinga Field, a distance of approximately 41 miles. The two main trunk lines continue in a southeasterly direction from the company's Junction pump station, at which point the Coalinga line enters the system. The two main trunks which extend from Junction to Midway take care of the company's production and purchases in the Lost Hills, Belridge, McKittrick, Elk Hills and Midway Fields. To handle oil run from the Maricopa or Sunset section of the Midway-Sunset Field, the company has one line connecting with the two main trunks at Midway. The Kern River Field, which lies approximately 40 miles east and a little north of McKittrick, is taken care of by a single 8-inch line passing through Buttonwillow, Rio Bravo and Rosedale, there being pump stations at these points.

In addition to this San Joaquin Valley system, designated as the Producers Pipe Line, the Union has another important trunk, the Lompoc pipe line, which handles production and purchases in the Santa Maria fields of Santa Barbara County. This line, which is also an 8-inch and has a capacity of approximately 15,000 bbls. a day, runs southeastward from Avila on the coast and passes through Summitt, Orcutt and Bell, three pump stations along the route. The Union's Ventura pipe line, which takes care of production in Ventura County, traverses the productive Santa Clara Valley and runs from Ventura to Santa Paula, from which point gathering lines run up through Ojai, Sespe, Fillmore and Bardsdale. The Ventura pipe line, the first oil carrying pipe line system in the State of California and probably the first laid west of the Rockies, is one of the most unusual in the State in that it does not require pump stations, the oil being gravitated from the various producing groups southwesterly to Ventura.

Construction work on this line was initiated in 1884 but, due to the mountainous country, it was some time before the system was finally completed. In many cases the line is literally hung along the canyon walls and suspended on cables across numerous ravines. The main trunk, which is made up of 2, 3 and 4-inch pipe, represents a considerable amount of engineering work, but it is probably one of the cheapest operated lines in the State. Its terminus is at Santa Paula, where the Union has a small refinery. Part of the original line laid in 1884, and which is still in active use, was brought around the Horn to Los Angeles and Ventura, from which points it was transported by railroad and trucks to its present location.

Pan American System

The Pan American has the latest and perhaps the most modern pipe line system in the State, the main trunk extending from the Elk Hills Field in the San Joaquin Valley to Los Angeles harbor and Watson tank farm and refinery, approximately 125 miles. It is the largest line laid over the Ridge Route in the Tehachapi Mountains and, in addition to being the longest welded line in the State is the only system in California entirely equipped with Diesel engine power. It parallels the oil line of the General Petroleum and the gas line of the Midway Gas Co. for a large part of the distance covered, although the routes diverge at several points. In building its line, the Pan American chose a route which differs in several important respects from that followed by the other two lines. The General Petroleum and Midway Gas Co. lines are routed around Wheeler Ridge, while the Pan American system is routed over it. Through this mountainous section the line literally runs up and down hill in practically a straight line, regardless of the contour of the country. The company's engineers decided at the very outset to lay as large a line as possible in order to reduce friction.

The General Petroleum line from the an Joaquin Valley to Los Angeles is an 8-inch served by seven pump stations located at advantageous points along the route, while the Pan American line is larger in diameter and requires but five pumping plants. The Pan American, handling a slightly lighter gravity oil with consequent less friction, decided to use a 10-inch pipe, eliminate the usual heating units and install adequate Diesel engines supplemented by emergency electrical power. The increased cost of this larger pipe is offset by a lower operating cost and the fact that its use allowed a reduction in the number of pump stations required because of the smaller friction. The company's first pump station is its Lake plant at Taft, which delivers the oil over a comparatively flat country to the foot of Wheeler Ridge, where another pump station boosts the oil to the crest, from which point there is a gravity flow to Grapevine at the foot of the Ridge. The Grapevine pump station shoves the oil through to Tejon, where the fourth station boosts it over the top of the Ridge Route and across Liebre Canyon to the fifth and last station at Newhall, which pumps it the remainder of the distance to Wilmington. The line has a capacity of 30,000 bbls. daily and it requires about three days to pump a barrel of oil from Taft in the San Joaquin Valley to Watson refinery near Los Angeles harbor.

Pumping Equipment

Each pumping plant is equipped with two 300-horsepower Diesel engines and two pumps with a capacity of about 30,000 bbls. a day. In addition to this equipment the plant has auxiliary electrical equipment including generators for use in any emergency. Adequate housing facilities are provided at each of the five plants for a normal crew, which consists of seven men, three shifts of two pumpers each and an engineer. The Pan American's line has just finished its first three year's service, during which time it has caused no trouble whatsoever. In the event that future operations indicate the necessity for a greater capacity this situation can be met by adding additional power and pumping units at each station. The pumping plants are constructed of reinforced concrete, but allowance has been made so they can be enlarged at a minimum expense. Instead of building the four walls of reinforced concrete, one end has been finished with a sheet iron which can be torn out quickly in the event that additional equipment is needed in the future. The oil being run at present is of comparatively light gravity, but if any heavy oil production is secured, adequate heating units can be installed within a short time. The completed line, which was constructed by the Petroleum Securities but subsequently turned over to the Pan American, is buried from 4 to 6 feet, depending upon the country. The average through the Tehachapi Mountains, which are snow covered during a part of the winter, is around 5 feet. The total cost of this line was somewhere in the neighborhood of $4,000,000.

This gives a hint of the ups and downs in the Ventura Avenue Field.

Los Angeles Harbor

Due to the proximity of producing fields in southern California to Los Angeles harbor, this area presents the most congested section of the State. Practically every major operator in California has one or more lines connecting the various fields with refineries and marine docks at Wilmington, from which point crude and refined oils are shipped to all points of the world. The Standard and Union have, perhaps, the most comprehensive systems, covering as they do practically every field in this particular area. Due to the location of the various producing fields, the numerous main trunk lines look more like feeders or gathering lines in some large district. The Union system, for instance, consists of two lines southward from Norwalk to its Los Angeles refinery at Wilmington, which parallel one another for some distance. The company's lines in this section vary in diameter from 6 to 8 and 10 inches, depending upon the fields served and the quality of oil handled. The ship loading line extending from the refinery to the marine dock at Wilmington, a distance of about 2 miles, is a 10-inch.

The Standard's lines are also 6, 8 and 10 inches in diameter, although there is one 12-inch extending from the El Segundo refinery to Wilmington. The company has an 8-inch and a 6-inch from Inglewood to El Segundo and combinations of 6, 8 and 12-inch from this point to Wilmington. Lines of similar dimension also feed westward to El Segundo and southward to Wilmington from Northam and Newmark, the production of the various fields being picked up en route. The company has two 8-inch lines from Huntington Beach which enter the main system at Northam, from which point the oil is pumped to either El Segundo or Wilmington, depending upon the disposition to be made of it. Very few operators are familiar with the fact that the Standard has a combination 2-inch and 3-inch line extending from Newhall to Ventura on the coast, and, although it is not in use at present, it is in good shape and capable of handling oil if conditions warranted.

Submarine Pipe Lines

The Associated Oil Co. has four submarine pipe lines in California, two at Monterey and a like number at Ventura. Both of these points are open harbors devoid of natural geographical protection and it has therefore been necessary to construct submarine pipe lines to facilitate the loading of tankers out in the open sea. The submarine lines at Monterey form the western terminal of the company's Coalinga Monterey pipe line system which originates in Coalinga in Fresno County and terminates at Monterey on the seacoast 106 miles away. The company's original loading and storage facilities at Monterey were destroyed by fire resulting from lightning early in 1925 and in replacing the destroyed equipment a few months later it was decided to modernize pipe line and loading facilities by installing two submarine lines. Two submerged lines were accordingly laid, a 12-inch for heavy crude and an 8¼-inch for light oil, both of which are welded and can handle 6,000 bbls. of light crude oil per hour by using two 12-inch rotary pumps or 3,000 bbls. an hour by gravity flow. The company's storage tanks at this point are on a ridge at a considerable elevation and the oil can thus be gravitated from the shore to tankers if desirable. The Associated's two submarine lines at Ventura handle on an average about 50,000 bbls. per day and form the chief outlet for crude oil produced in the prolific Ventura Avenue Field.

Previous to the development of large consistent production at Ventura Avenue the Associated anchored its tankers about 800 feet off the end of the old wharf and ran out an 8-inch rubber hose. The stringing of this hose every time a tanker came in always caused considerable loss of time and, as a whole, the practice was slow and unsatisfactory. The company's engineering staff undertook the job of laying a submarine line and it was carried through to a successful conclusion in a minimum length of

Natural Gasoline Expansion Rapid

Present Output of Plants in California Is 20 Per Cent of Total Gasoline Available. Manufacturing Methods Improve

By L. P. Stockman

The natural gasoline industry in California has shown a phenomenal growth during the past 10 years coincident with the discovery and development of the numerous prolific flush fields opened up during this period. Production and utilization has shown a consistent increase month after month until at the present time the production of natural gas gasoline forms 20 per cent of the total amount of gasoline produced in California. During the 12 months of 1927 a total of 11,660,536 bbls. of natural gasoline were produced, as compared with 3,786,683 bbls. of cracked gasoline and 43,462,076 bbls. produced by ordinary distillation methods. For the first nine months of the current year these figures were 9,511,828 bbls., 4,777,540 bbls. and 33,345,631 bbls. respectively. The consistent increase in natural gasoline production from year to year and the ascendency of this industry to one of extreme importance is due to two basic factors, efficient operation and increased production of natural gas. Increased efficiency of plant construction and operation has become especially marked during the past decade and as time goes on additional improved equipment will effect still greater recoveries.

The increasing supply of natural gas resulting from consistent development of flush fields is perhaps the largest single governing factor which contributes to progressively larger maximum production year after year and, while this condition will probably exist for some time to come, due to increased exploration work the concerted conservation movement under way in California will no doubt play a very important part in future operations, as this should tend to stabilize conditions by preventing periods of excessive production. In the past, natural gas gasoline plant operators have for the most part been concerned chiefly with the securing of an adequate supply of natural gas to meet plant capacity and then stripping it as efficiently as possible, very little concerted thought being given to the advisability of returning the dry gas back into tthe producing formation instead of selling it for commercial fuel.

This procedure has many disadvantages, the most important of which has been the necessity of installing large, costly plants for a relatively short time during periods of flush production. Future scientific conservation work, when it becomes general and comprehensive in scope, however, will probably eliminate this unfavorable factor by stabilizing the supply of natural gas to a large extent and operators will not be obliged to erect large plants to handle flush production and subsequently find themselves overbuilt.

The value of natural gas has not been generally appreciated by producers in the field and consequently production activities in the past have not been as efficient as they would have been if the energy of natural gas had been utilized to the highest degree. Excellent work has been accomplished during the past few years with gas lift and repressuring operations, but this constructive work has not yet become statewide in its scope.

Large quantities of natural gas have been blown into the air in many cases due to a lack of co-ordinated effort. Many depleted fields throughout California should be repressured immediately regardless of property lines while there is a surplus of natural gas. This would be of great importance to natural gasoline plant operators as the recycling of dry gas would provide additional quantities of natural gasoline and at the same time stimulate the production of crude oil.

The gas conservation program now under way at Santa Fe Springs is the first concerted attempt to eliminate gas waste and the anticipated successful conclusion of this commendable policy will undoubtedly lead to similar work in other areas, as it has almost unlimited possibilities. The repressuring plan should strike a responsive chord in the heart of every progressive plant operator, as this program contemplates the storage of excess natural gas in upper depleted zones until needed instead of blowing it off into the air. The advantages which must of necessity accrue to this constructive policy are quite obvious. It is the present intention of the sponsors of this storage and repressuring work to continue an aggressive conservation policy at Santa Fe Springs for 20 years, as a recent survey has indicated the availability of sufficient gas to take care of requirements during this period. It is needless to say that such a constructive plan will stabilize the production of natural gasoline and assure these plant operators of continuous operation instead of the temporary flush conditions which have existed in the past due to failure to conserve natural gas and utilize its inherent energy.

The repressuring plant at Santa Fe Springs contemplates the storage in the Foix and Meyer zones of all excess natural gas resulting from deep zone exploitation and a duly incorporated organization will be charged with the obligation of carrying this program to a successful conclusion. The introduction of this dry gas into the depleted Foix and Meyer zone, instead of permitting it to be blown off into the air, is the most progressive step of this kind ever undertaken in California up to the present time. A technical committee of this association will determine the method of procedure and the number of wells to be selected as receivers. Operators in the field will deliver gas to the repressuring company free of charge, and the cost of injecting this natural gas into the upper zones will be assessed equitably among all participating operators. In addition to this repressuring plan, operators have sanctioned a curtailment program which will prorate or limit the production of each individual project completed in the lower horizons.

It is the present intention of operators to eliminate economic waste and deep-zone production will be arbitrarily reduced every time a genuine surplus exists. In other words, if it becomes necessary for operators to dissipate gas into the air because the supply exceeds the demand production will be curtailed to an extent sufficient to eliminate existing surplus. The advantages of this conservation program at Santa Fe Springs are quite obvious and natural gasoline plant operators will undoubtedly be in hearty accord, as it will stabilize the production of natural gas and eliminate the period of extreme flush production which, under ordinary unrestricted conditions, would occur early next year.

September Production

During the month of September, 1928, a total of 32,784,808,000 feet of natural gas was treated by California plant operators. The recovery of natural gasoline approximated 43,163,455 gallons, or 1.41 gallons for each 1,000 feet of wet gas treated. Long Beach, due principally to deep-zone development, headed all fields of the State as 11,323,583,000 feet of natural gas from this field were run through plants with an ultimate recovery of 17,552,909 gallons of natural gasoline. Ventura Avenue ranked second in point of natural-gas production, although the 7,669,491,000 feet of gas treated only yielded 4,821,787 gallons of natural gas gasoline. Santa Fe Springs is credited with 1,024,111,000 feet of natural gas and 2,837,811 gallons of natural gasoline during September, but this does not reflect deep-zone development now well under way.

During the month of September 23,865,208,000 feet of natural gas were treated by oil-absorption plants throughout the State and based on the actual recovery of 30,862,936 gallons of natural gasoline the recovery was 1.29 gallons for each 1,000 feet of saturated gas treated. Compressors handled 253,314,000 feet of natural gas and yielded a recovery of 273,056 gallons, or a unit recovery of 1.08 gallons. Combination compressors and oil-absorption plants took care of 8,666,286,000 feet of natural gas and recovered 15,027,463 gallons of natural gasoline for a unit recovery of 1.73 gallons of natural gasoline for each 1,000 feet of gas treated.

The growing importance of the natural gasoline industry in California is manifested by the consistent increase year after year in both the amount of natural gas treated and the quantity of natural gasoline recovered. The amount of natural gas treated in 1925 approximated 236,697,217,000 feet and increased to 284,364,773,000 feet in 1926. This substantial increase continued up through 1927 when 336,094,426,000 feet were run through natural gasoline plants and, based on operations for the first nine months of the current year and an anticipated increase in production at Santa Fe Springs and other flush areas, more than 360,000,000,000 feet will be treated during 1928.

From the accompanying tables it will be noted that the recovery of natural gasoline effected during this period has also registered a very consistent increase. From 1925 to 1927 inclusive, production of natural gas increased progressively from 303,180,077 gallons to 389,336,337 gallons and 489,742,513 gallons respectively. A total of 399,506,016 gallons have been recovered during the first nine months of 1928 and a new record will undoubtedly have been established before the present year draws to a close.

Utilization of Gasoline

The greater part of the total production of natural gas gasoline in California is used for blending purposes at refineries although approximately 15 per cent is sold as commercial gasoline or mixed with crude or unfinished oils to facilitate its transportation to refining centers. There has been a very marked tendency in California during the past several years to minimize the amount of natural gasoline mixed with crude oil and to stimulate the policy of using this product for blending purposes on a larger scale. The growing tendency of preserving the entity of natural gasoline and using it to sweeten straightrun gasoline was especially noticeable between 1926 and 1927 when the quantity blended jumped from 4,689,610 bbls. to 7,166,279 bbls.

This big increase was due to the laying of several large natural gasoline lines, the most important of which was the Shell company's 100-mile installation extending from the prolific Ventura Avenue Field to Los Angeles Harbor. Over 1,000,000 bbls. of natural gasoline are transported through this line yearly. The amount to be blended at California refineries this year will exceed 9,000,000 bbls. and may reach 10,000,000 bbls. If Santa Fe Springs comes up to expectations. The policy of mixing natural gasoline with crude or unfinished oils to facilitate pipe line transportation showed an increasing tendency between 1925 and 1927 but a very decided aversion to this practice took place during 1928. The

NATURAL GAS TREATED IN CALIFORNIA (in m.c.f.)

1928—	Oil absorption	Compressor	Combination comp. and oil absorpt'on	Charcoal absorption	Total
January	16,824,594	258,571	9,695,597	.....	26,778,762
February	16,349,485	245,863	9,224,811	.....	25,820,159
March	17,513,733	253,647	9,603,262	.....	27,370,642
April	18,397,305	246,904	9,139,908	.....	27,784,117
May	21,014,723	252,681	9,282,098	.....	30,549,502
June	21,974,750	245,303	8,483,082	.....	30,703,135
July	23,410,694	246,210	8,902,798	.....	32,559,702
August	23,461,861	246,919	8,850,612	.....	32,559,392
September	23,865,208	253,314	8,666,286	.....	32,784,808
Total, 1928	182,812,353	2,249,412	81,848,454	.....	266,910,219
Total, 1927	210,377,985	3,153,405	113,920,604	*8,642,432	336,094,426
Total, 1926	169,816,290	3,960,869	96,059,666	14,527,948	284,364,773
Total, 1925	171,802,478	4,907,064	59,987,675	.....	236,697,217

*Shut down in October, 1927.

PRODUCTION—DISTRIBUTION AND STOCKS OF CALIFORNIA NATURAL GASOLINE
(Barrels of 42 U. S. gallons)

1928—	Monthly production	Mixed with crude or other oils	Blended at refineries	Shortage and evaporation losses	Stocks on hand
January 1	.....	.....	.....	.....	599,216
January 31	999,216	212,395	911,243	66,436	531,041
February 29	922,282	202,278	743,399	57,346	651,096
March 31	993,358	210,557	612,552	134,825	586,520
April 30	1,023,241	201,918	707,099	10,416	690,328
May 31	1,077,325	135,826	804,175	21,357	833,807
June 30	1,084,242	136,007	789,944	98,290	893,808
July 31	1,152,960	148,234	814,192	69,072	1,015,270
August 31	1,160,074	148,133	990,582	195,079	1,209,890
September 30	1,099,130	127,773	832,672	8,323	1,340,252
Total, 1928	9,511,828	1,523,121	7,205,858	661,144	.....
Total, 1927	11,660,536	3,370,071	7,166,279	843,322	.....
Total, 1926	9,270,627	3,296,518	4,689,610	1,054,222	.....
Total, 1925	7,218,574	2,565,022	4,121,526	539,524	.....

NATURAL GASOLINE PRODUCTION IN CALIFORNIA (in gallons)

1928—	Oil absorption	Compressor	Combination compressor and oil absorption	Combination oil and charcoal absorpt'n	Charcoal absorpt'n	Drip	Total
January	26,974,569	327,168	14,641,977	.....	.....	32,639	41,976,353
February	24,389,756	288,887	14,036,810	.....	.....	20,387	38,735,840
March	26,476,705	292,975	14,882,514	.....	.....	68,830	41,721,024
April	27,963,621	286,979	14,709,694	.....	.....	15,834	42,976,128
May	30,011,018	297,459	14,927,486	.....	.....	11,632	45,247,635
June	30,537,634	295,455	14,698,386	.....	.....	6,679	45,538,154
July	32,713,186	296,362	15,407,011	.....	.....	7,768	48,424,327
August	32,794,224	297,071	15,625,836	.....	.....	5,969	48,723,100
September	30,862,936	273,056	15,027,463	.....	.....	.....	46,163,455
Total, 1928	262,723,649	2,655,452	133,957,177	.....	.....	169,738	399,506,016
Total, 1927	266,915,524	4,859,675	176,149,048	40,386,138	762,263	169,865	489,742,513
Total, 1926	183,472,906	5,801,139	142,027,856	56,094,597	1,796,013	173,826	389,366,337
Total, 1925	176,659,197	6,718,091	86,156,130	33,367,546	.....	279,113	303,180,077

amount mixed with crude during 1925 to 1927 inclusive aggregated 2,565,022 bbls., 3,296,518 bbls., and 3,370,071 bbls. respectively. During the first nine months of 1928 only 1,523,121 bbls. had been utilized in this manner and it is safe to assume that this figure will not exceed 2,000,000 bbls. for the entire current year.

Gasoline Association

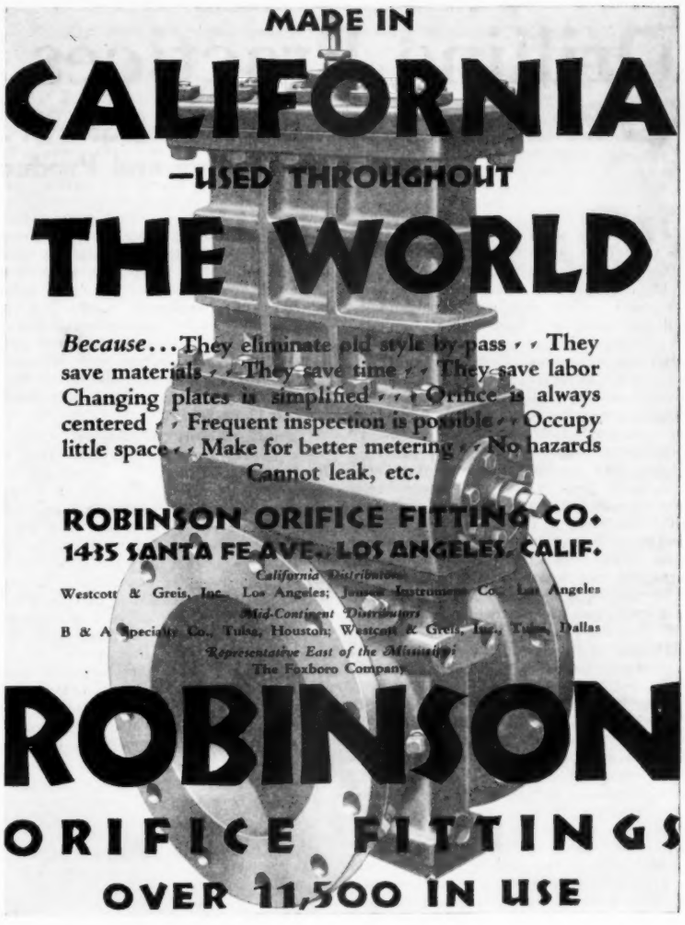
The California Natural Gasoline Association has played a very important part in the progress made by the natural gasoline industry in California during the past two years or so and this organization will become of still greater importance as time goes on. It came into being in December, 1925, when a group of operators met for organization purposes at the Shell company's assembly hall at Long Beach and elected a representative committee to formulate a set of by-laws and perfect necessary rules and regulations.

The California Natural Gasoline Association is the outgrowth of a number of informal meetings held by progressive plant operators who had been collaborating for some time on a number of tests and meeting informally about once a week. Upon organization of the association in December, 1925, Paul Barton was elected president, J. A. Campbell, vice president, and J. S. Watson, secretary-treasurer. These officers were elected to serve for a period of six months but in reality completed a full year's service.

The first concerted action of the California Natural Gasoline Association was taken in January, 1926, less than one month after organization, when it sponsored a group session of natural gasoline plant operators in conjunction with the American Petroleum Institute, which was holding its regular annual meeting in Los Angeles at that time. By-laws were adopted and final organization completed in June, 1926, at which time the association had a total of 30 aggressive members. At the fall meeting last year the membership rolls carried the names of 300 progressive operators. Membership, however, has more than doubled during the current year as the association has 630 members at the present time. During the first three years of its existence the association has presented and discussed 50 technical papers and has been responsible for the compilation and publication of two important bulletins on standardization.

These two bulletins, incidentally, have been adopted as standard practice by all major California operators and the recommended standardized procedure is coming into general use quite rapidly. Copies of these two bulletins, which can be secured through the association, cover the adopted standardized procedure for the charcoal test for the determination of gasoline content of natural gas and the standard barometric pressure for natural gas measurement. The standardized pressure charcoal test and the standard barometric pressure for gas measurement which has been adopted by the California Natural Gasoline Association ties in with accepted engineering standards already adopted by large companies and an effort is being made to have these practices adopted generally in order to bring the various present methods into harmony.

The officers of the California Natural Gasoline Association are G. L. (George) Ratcliffe, president; H. L. (Herb) Eggleston, vice president, and H. W. Parmelee, secretary-treasurer. The executive committee consists of G. L. Ratcliffe, General Petroleum Corp.; H. L. Eggleston, Pan American Petroleum Co.; R. E. Beckley, Standard Gasoline Co.; O. C. Field, O. C. Field Gasoline Corp.; R. W. Garman, Union Oil Co. of California; J. N. Hicks, Superior Oil Co.; H. R. Linhoff, Richfield Oil Co. of California; H. W. Parmelee, Lovell Gasoline Co., and J. S. Watson, Shell Co. of California. Permanent association headquarters are located at 733 Higgins Building, Los Angeles, Calif.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Drilling Practices in California Fields

Remarkable Development of Specialty Tools and Rapid Evolution of Drilling and Production Equipment on Pacific Coast

Wildcat exploration and deep drilling in a number of areas in California during the past few years has resulted in the development of specialty tools and a rapid evolution of drilling and production equipment. Core drilling, underground well surveying and improved equipment have been especially marked and in the perfection of operation, ease, simplicity, flexibility, adaptability and reliability have been especially stressed. Underground surveying and core drilling go hand in hand and progressive operators have co-ordinated these new lines of endeavor with unusual success. The old acid bottle test, while still in use, has been supplanted by all major operators with the more accurate and scientific method of ascertaining the deviation of wells from the perpendicular. Oil-well surveying has become quite general in California fields, especially during the past year, and the advantage and advisability of determining the exact status of individual wells as far as possible has been demonstrated in a number of cases. The intensive town-lot drilling campaign which has characterized development work in the Long Beach Field did not present any difficult problems during the early stages of work, but when wells became more numerous and deep drilling got under way drilling problems became more complex, due to the tendency of deep wells to deviate from the vertical. In many instances drilling wells have collided during the course of work and in several cases producing wells were effectively killed by being mudded off because of the intrusion of rotary drilling mud from adjoining drilling projects.

Crooked-Hole Trouble

The surveying of deep wells is especially advantageous in projects located in proven fields which have failed to come up to expectations. During the course of deep drilling at Long Beach there was a marked irregularity in the initial daily production of new wells. Drilling wells near the edge of the field in some instances showed a high initial consistent production, while others nearer the apex of the structure proved dismal failures. This lack of uniformity could not be accounted for until well surveying became more general and it was found that in practically every instance the unusual results secured were due to substantial deviations from the perpendicular. Edge wells which showed large production were found to have deviated toward the center of the field, while other more favorably located projects which failed to show a proportionately better production were found to have drifted down the dip and away from the area of concentrated production. Projects located in territory proven up for substantial production were accordingly plugged back and redrilled, the outcome in practically every case justifying the cost of surveying and initiation of subsequent corrective work.

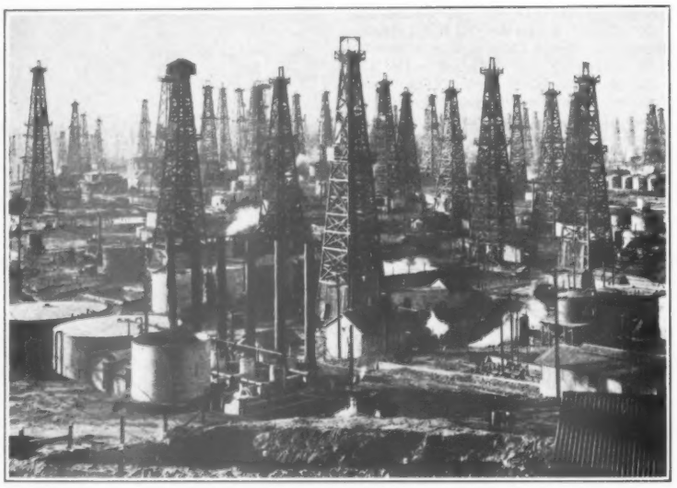
Core drilling has come into such general use that it is considered as more or less of a necessary adjunct to all successful work, particularly in California, where rotary drilling predominates and oil sands can be mudded off unless watched closely. It is especially advantageous and has been utilized with exceptional success in the drilling of prospect holes in wildcat areas and in the development of proven areas. The correlation of definite markers is especially desirable in new fields, as these points indicate the trend of the structure and give operators data upon which to predicate subsequent work. The coring of water sands and the depth of shale bodies where water strings may be landed above the oil has been made possible accurately and definitely by the use of core barrels. Core drilling and underground surveying can be worked together very admirably and usually indicate a closer approximation of subsurface conditions than could be secured under ordinary conditions. A core in itself does not prove the existence of any conclusive structural condition unless the hole has been surveyed and allowance made for deviation. The two results can be correlated very satisfactorily, however.

Need Heavy Equipment

Progressive deep drilling has made it practically obligatory for operators to install heavier equipment and in many cases augment or supplement existing mechanical devices. This has been especially noticeable in the construction of slush pumps, crown blocks and traveling blocks. The necessity of maintaining consistent positive circulation and insuring a continuous flow of mud is of paramount importance in rotary drilling and the tendency along this line seems to be toward heavier and more powerful unit operation. Crown blocks and traveling blocks have shown a rapid consistent evolution during the past several years, as far as California is concerned, and the double-deck type with casing sheaves on the top deck has come into general use. Rig construction has kept step with the progress of time and in the most recent California fields steel derricks have become the rule rather than the exception.

Development work in California during the past several years has opened up several extremely high pressure fields, notably at Santa Fe Springs, Ventura Avenue and Long Beach, and special precautions have become necessary to prevent premature blowouts. The usual method consists of a generous application of barite or hematite to the drilling fluid to increase its specific gravity, the installation of some form of mechanical blowout preventor and the exercise of every possible precaution to prevent the well from getting beyond control. The Milham Exploration Co.'s 50,000,000-foot gasser at Kettleman Hills and the two recent serious catstrophes which overtook George F. Getty's No. 12 Nordstrum and the Bellview Oil Co.'s No. 2 Grohs at Santa Fe Springs are ample evidence of the high gas pressures encountered in some California fields and the necessity of taking proper adequate precautions. The two blowouts at Santa Fe Springs completely demoralized conditions in the immediate area of each, for in addition to forcing a compulsory suspension of drilling they resulted in the destruction of many rigs and the ruination of drilling equipment. No. 17 Nordstrum, incidentally, ran wild for seven weeks before being brought under control, and while it is impossible to really appreciate the entire economic loss from blowouts in intensely developed areas their destructiveness to property is quite evident.

Extremely high gas pressures, ranging in excess of 1,000 pounds per square inch, have been recorded at Santa Fe Springs, Long Beach, Ventura Avenue and Kettleman Hills, and this pressure has sometimes greatly retarded drilling operations. In several instances only 10 hours of actual drilling have been possible out of every 48 hours, the remaining time being required in mudding up the hole and adding barite or hematite in order to prevent premature blowouts. It is not at all uncommon for wells in California high pressure fields to require in excess of 500 tons of hematite during the course of work. The use of heavy substances, including hematite and barite, to increase the specific gravity of the circulating fluid entails extra vigilance to prevent the sticking or freezing of drilling pipe in deep holes. Several methods have been adopted by California operators, the procedure followed out depending upon the type of power used. It is generally customary to attach the dead line to the calf wheel and the band-wheel engine can be brought into use in case anything goes wrong with the drawworks or rotary table.



A section of Signal Hill.

Quick Drilling

The Drake well, drilled with a spring pole at Titusville, Pennsylvania, in 1859, required about three months' time to reach a total completion depth of 69 feet. Efficient California operators, with improved equipment, have been finishing prolific producers below the 6,000-foot level in about the same period of time, although the total field average in many cases, of course, due to fishing jobs and mechanical trouble, usually runs from four to six months. Deep drilling, which today means anywhere between 5,000 and 8,000 feet, has necessitated the use of long strings of casing and in order to capitalize on the safety factor and reduce the possibility of mechanical trouble to a minimum, pipe is very often floated in by means of a check valve which tends to cut down the weight or pull on the hoisting equipment by operating against pressure from beneath, but which responds to pressure from above and thus permits a free circulation of drilling fluid. This practice is becoming quite common in California development work, especially in deep zone exploitation. Deep drilling at Long Beach has been characterized by a very large number of "C.P." jobs. The policy of cementing through perforations has also become quite common in California under certain favorable conditions, although it is customary to land two or more strings of casing whenever advisable or necessary to secure a positive shutoff and reduce the possibility of contaminating the oil-bearing formations by edgewater encroachment or by infiltration from intermediate water zones.

Practically every piece of mechanical equipment used in the drilling of new wells or subsequent production activities has reflected a radical departure from early methods. This has been manifested to a large degree in the increasing number of newly designed drilling bits which have made their appearance during the past several years and the use of hard facing which has come into general use, especially when drilling in areas which contain extensive thicknesses of extremely hard sand or tough conglomerates. Core bits also reflect a decided improvement in both design and performance and with the development of core barrels for cable-tool operation, future prospecting work in wildcat districts and drilling operations in proven fields should become more accurate. Drilling hazards have been reduced to a minimum, and it is now possible to secure specially designed tools for practically any fishing jobs which may occur, ranging from various socket type tools for overshot purposes to those of the corrective type consisting of cutters, etc. The various improved fishing devices which are available today are the result of diligent experimentation and concentrated effort on the part of both producers and manufacturers and indicate the steady forward movement in oil-field development resulting through the scientific application of highly specialized equipment designed for the purpose of remedying whatever difficulties may be encountered.

Electricity is coming into a more general use in California for both drilling and producing activities as equipment has been perfected with a greater degree of flexibility, which, incidentally, originally retarded general utilization of this type of energy. Serious study has been given by California operators to the safety factor with regard to both the personal and mechanical factors. The necessity of careful work has been stressed in order to minimize personal injury and adequate protective appliances have been installed wherever needed. California was at one time more or less isolated, due to its geographical location, but this condition has become a thing of the past. Crude and refined oils have been moving to the Gulf and Atlantic Coasts by tankers for several years, and California equipment manufacturers are competing with others in all parts of the world. The large amount of development work normally undertaken in California offers a fertile field for the distribution of all types of machinery and equipment regardless of where it has been fabricated, and it is safe to say that practically every major national manufacturer of oil field equipment is represented.

UNIT OPERATIONS IN ROCKY MOUNTAIN AREA

(Continued from Page 54)

of the field. The producing area of the field was determined as far as possible and the area therein extended in acres. The area of each separate lease or tract was then calculated together with its percentage of the total acreage in the producing area.

On a production basis, the total production in the field was taken and it was considered that each tract or lease, whether developed or undeveloped, within the productive contour, produced that percentage of the total gas that its area represented in per cent of the total productive area. Under this plan, the available market demand is satisfied from the entire field and whatever that demand, every operator, land owner and royalty owner in the field shares in supplying it on a basis which is equitable and fair and at the same time the operators are enabled to conduct the field on a scientific basis, thereby preventing waste, maintaining the life of the field, and securing the maximum and most efficient recovery of the gas and contributing to the industrial advancement of the State and the comfort and happiness of its citizens. Efforts have been made to overthrow the unit operation of this field, not by the operators who have spent the money, nor by the Government or State, but by outsiders, who are ever ready to attempt to step in and reap the benefits of the pioneering and expenditures of the other fellow. The Little Buffalo Basin unit operation plan is so necessary and sound and beneficial, that I believe it will be adhered to by the operators and land owners, private, government and state. In there efforts to work out this situation in the field, the operators have found both the Government, through the Secretary of the Interior and United States Geological Survey, and the State through its Board of Land Commissioners, appreciative and sympathetic and disposed to co-operate.

Among the small producing fields in Wyoming, the Mule Creek Field has for several years been operated as a unit, with increased benefit to all concerned.

In the year 1926, it was conservatively estimated that in the black oil fields in Wyoming there existed a potential developed production of black oil in excess of 20,000 bbls. per day, which remained shut in and which did not command either a market or a price sufficient to return cost of production. Some of this oil had been shut in for a number of years, awaiting improved conditions in the black oil situation, which failed to materialize, on account of the overproduction of both light and heavy oil in the country.

Oregon Basin

In August, 1926, the Oregon Basin Field, government owned, which had been previously proven for gas, came in as another and additional black oil field when a producing oil well was completed by the Ohio Oil Co., which had the preceding year developed gas in the field and pipe it into Cody, Wyo. The Oregon Basin Field in apparent extent is a large one and has prospect of ranking as one of the major pools of the Rocky Mountain region. The ownership in the field was greatly diversified, with the result that not long after the discovery oil well was completed in August, 1926, at least a dozen operators were actively engaged in drilling in different parts of the field and in practically every instance production was obtained, the wells ranging from 250 to 2,000 bbls. per day initial production of asphaltic base oil. This resulted, in 1927, in an overproduction in the field, and operators sold oil anywhere from 25 cents to 85 cents per barrel, prices insufficient in most instances to return cost of production. For the most part, the operators sensed the real situation and the dangers and were willing to agree on a suspension of activity as soon as their initial lease requirements were taken care of and their discovery wells completed. One operator, however, did not accept the attitude of the majority and proceeded with an intensive drilling program, completing well after well as rapidly as they could be drilled, and adding to the flood of oil. This in turn compelled the adjoining operator, who was reluctant to proceed but was compelled, nevertheless, to speed up his development work to offset his active neighbor and prevent drainage. Fortunately or unfortunately, this great activity took place in just one portion of the field where oil was first discovered.

By midsummer of 1928, the situation had developed that a great deal more oil was in sight than could possibly be marketed at any price, and yet the drilling of additional wells costing in excess of $50,000 each, continued, at a slower rate, it is true, but still unabated.

Effort for Conservation

Finally, in October, 1928, the operators in the field held a series of meetings to take account of their situation, and see what could be done. At these meetings, all but two operators were represented and evidenced their willingness to, if possible, inaugurate the unit operation of the field. Due to the intensive development in ope part of the field, it was not deemed possible to adopt unit operation or even a proration plan as to the entire field. The operators have organized and selected a fact finding commission of five of their number, and this committee is engaged in making a detailed survey and gathering additional data, with a view to working out at least a modified plan of unit operation and proration which will conserve the oil and gas, prevent undue waste and overproduction as to all of the field except the one spot in which the intensive development and offsetting has occurred. The experience in other Wyoming fields and benefits obtained, makes it probable that some degree of success will be attained in the effort to bring the Oregon Basin Field, or the major portion of it, under unit operation. Even though unit operation or complete proration cannot be agreed upon, a suspension or partial suspension of drilling of new wells will probably result until such a time as an adequate market is developed for the oil.

It is probable, in view of past experiences, that the operators in the Rocky Mountain district will secure results in the future, as they have in the past, from some system of prorating production on a well capacity or acreage basis, combined with a modified unit operation and suspension of drilling program similar to the one used in Salt Creek and Little Buffalo Basin, in Wyoming.

In the foregoing, I have, as far as possible in the short time alloted, endeavored to picture briefly the unit operation situation, with some of its angles, and in its relation to the fields of the Rocky Mountain region. It is certainly true that unit operation is a sound procedure, and as necessary in this district as elsewhere, and that the operators in the Rocky Mountain region have made a good beginning along this line in a number of fields, and may be expected to keep pace with the operators in the older and larger oil districts of the country in extending unit operation whenever necessary.

CENTRAL WEST

(Continued from Page 57)

White is a fair gas well from the second Cow Run sand at from 700 to 706 feet.

Scattered Development

Ohio Fuel Gas Co. made a location for No. 1-3,370 on the E. B. Blair, Section 8, Bethel Township, Monroe County. Same company is drilling No. 1-3,303 L. C. Stallings, Section 9, Franklin Township, same county.

In Washington County, Fairfield Township, the Ohio Fuel Gas Co. has a fair gas well at No. 1-3,326 on the Goldie M. Schulty, Section 1.

The Logan Gas Co. made a location for No. 3 on the Colpitts-Boswell property, Section 26, Warren Township, Belmont County.

Ohio Fuel Gas Co. made a location for a test on the John R. Larzelers, Section 5, Harrison Township, Perry County, also a location for a test on the Charles Watts, Section 13, same township. Same company is drilling No. 1-3,182 on the C. O. Milligan, Section 29, same township. Same company made a location for a test on the S. H. Shaffell, Section 12, Reading Township, same county.

Indiana

Four completions were made in Indiana. In Gibson County, Washington Township, William Bell and others' second test in the northwest corner of the Ira Seifers, in the southwest quarter, Section 1, pumped an initial of 16 bbls. Top of sand was found at 1,592 feet and drilled to a total depth of 1,601 feet. In Barton Township, Bell Brothers test 860 feet from the south line and 200 feet from the east line of the H. Schumacher, in the northeast quarter, Section 17, was a dry hole at 1,412 feet. Joe S. Young, Jr., and others abandoned No. 1 on the George Finch, Section 6, same township.

In Pike County, Monroe Township, the Gem Oil Corp.s No. 4 well, 450 feet from the south line and 1,320 feet from the west line of the August Yeager, in the southwest quarter, Section 9, produced 100,000 feet of gas in a shallow sand from 214 to 249 feet. In Clay Township, the Bement Gas Co.'s test in the northeast corner of the J. M. Davidson, in the northeast quarter of Lot 12, topped sand at 1,297 feet and found 9 feet of sand at a total depth of 1,306 feet, gauging 300,000 feet.

Indications are that southern Indiana will soon get a heavy drilling play as new heads are coming in from both the east and the west. New York capitalists are taking leases in that area in large blocks, and have at the head of their operations C. Walter Randall, formerly head of the old Waters-Pierce Oil Co. Mr. Randall is acting as trustee for the syndicate. A rig has already been set up and spudding started on the John C. Kinney heirs, in the south half of the southeast quarter of Section 16, Grass Creek Township, Spencer County. The interests have entered into a contract with R. W. Richards, of Spencer County, to drill two holes to a depth of 1,300 feet, unless oil is found in a higher elevation. A block of 10,000 acres, all connected up, has been selected for this project, which is strictly wildcat, although a well in which oil was found was drilled not far away about 10 years ago. A geological study and mapping of the acreage has been in progress since last February and the oil pool, if there is one, is estimated at 4 miles wide and 3 miles long. James E. Sharpe, for many years in charge of the Standard Oil interests in China, will be the superintendent of the works in the Indiana Field. A big play is anticipated by these interests over this wide territory, as well as other sections in southern Indiana. Geologists believe there is a big oil pool in southern Indiana somewhere and are drilling around in many locations trying to locate it. The fact that several small wells have been found on the Treat and Stuteville projects bears out the claims of the prospectors that a larger and better pool is somewhere in that section and should be found closer to the surface of the earth.

Illinois

All indications point to the opening up of a new oil pool in Illinois, by the finding of the Ohio Oil Co. in a test on the G. L. Tarlton, Jr., farm, Section 28, Sugar Loaf Township, St. Clair County, in western Illinois. The sand was topped at this well at 670 feet and the drill stopped at 701 feet, where the test showed a production of 25 bbls. in what is supposed to be the Trenton formation, which comes close to the surface along the east side of the Mississippi River. This test might mean an extension to the Waterloo Pool, in Monroe County, which adjoins St. Clair County to the southwest, where production was found in the Trenton at comparatively shallow depths. This Tarlton well brings home the fact that oil is being found near St. Louis as St. Clair County is just across the Mississippi River from St. Louis. East St. Louis is located in St. Clair County, although Belleville, is the county seat. St. Louis, a city that has been more or less interested in developments of oil fields both in the east and west, now has something to look forward to, with a commercial producer in almost its back yard. St. Louis parties were much interested in the wildcat venture made by Edward R. List on the F. W. Knowles farm, Section 16, Spring Grove Township, Jefferson County, also in Illinois, but far to the east of the new well found by the Ohio Oil Co. The Knowles farm test went to a depth of 2,100 feet where the hole filled with salt water. The old saying is that one well tests out only a few acres and Jefferson County may yet develop an oil field, being well located, to the east of the Ohio company's well and northeast of Monroe County production and in the same direction from the Campbell Hill Field, of the Ava Oil & Gas Co., in the northwestern part of Jackson County, where both oil and gas were found in commercial quantities in the Murphysboro area, and oil was found some years ago in Randolph County.

In Crawford County, Robinson Township, Charles Karns and others' test near the southeast corner of the Ira Walters, in the NW SE, Section 20, pumped 4 bbls. from a depth of 1,018 feet.

In the Allendale Field, Wabash Township, Wabash County, Joe S. Young, Jr., and others' test, 700 feet from the south line and 200 feet from the east line of the Collison heirs' farm, in the northwest quarter, Sections 13 and 14, came in a dry hole at 1,560 feet.

ASSOCIATION DECIDES TO EXPAND ACTIVITIES

SHREVEPORT, La. Nov. 24.—All officers of the Louisiana-Arkansas division of the Mid-Continent Oil & Gas Association were re-elected at the annual meeting here November 23, at which Harry Smith, secretary of the general Association was the speaker. The officers are M. J. Grogan, Louisiana Oil Refining Corp., president; C. R. Minor, Gulf Refining Co.; J. R. Crawford of Crawford & Sebastian; N. C. McGowen of Palmer Corp.; and D. B. Harris, Humble Oil & Refining Co., vice presidents; Ben Johnson, Commercial National Bank, treasurer; and Joseph B. Elam, secretary.

Following Mr. Elam's report of last year's activities, he and the president were directed to employ an assistant secretary as a step in broadening the scope of the association's activities in the Shreveport division, one of which will be greater attention given the natural gas phase of the industry and another an active participation in the opposition before congress to the adoption of the Jadwin plan for Mississippi River flood control as it effects the proven and prospective oil and gas fields of Louisiana. A committee of five was authorized to be appointed to consider this expansion in activities and the list of standing committees is to be added to by the creation of one to look after natural gas developments.

DEATH OF W. C. THOMPSON

Willis Claude Thompson, known as "Dick," son of Mary Amsler and Milton Thompson, born October 8, 1879, at McGraw, Pa., an oil well driller, who had worked in various fields both in this country and abroad, recently returned from Argentina, South America, with his son, John, to spend his vacation at the home of G. L. Green, 616 South Yorktown, Tulsa, expired suddenly November 19. Besides his sons, Harry, in Borneo, John, in Buenos Aires, and daughter, Mrs. Ruth McCleary, Long Beach, Calif., he is survived by his brothers, L. B. Thompson of Long Beach, Calif., and Ell Thompson, Holdenville, and a sister, Mrs. J. E. Tulloch of Holdenville.

DEATH OF E. T. CAFFREY

E. T. Caffrey, 50, a well known oil operator of Washington, Pa., and nationally prominent in the industry, died at his home recently. Born at Eldred, McKean County, Pennsylvania, he moved to Washington and had been engaged in the oil business many years. He operated in the western Pennsylvania Field at first but his activities later spread to the Kentucky, Kansas, Ohio, Illinois, Texas and Oklahoma Fields, in all of which he was interested, first with the Emerald Oil Co. of Washington, and later as an independent.

WILDCAT OPERATIONS IN WEST TEXAS

(Continued from Page 36)

T. W. Callahan et al's No. 1 J. S. Todd, C SW Sec. 13, Blk. "YZ," E.L.&R.R. Sur. ..... Top salt 905 ft.; set 8-in. casing 1,155 ft.; 2,000,000 ft. gas 1,205 ft.; shut down 2,208 ft.

W. W. Donnelly & Young's No. 1 Massey, Sec. 29, Blk. U-V ..... Shut down 380 ft.

W. W. Donnelly & Young's No. 1 Shannon, SW SW SE Sec. 42, Blk. BB, T.C.R.R. Sur. ..... Cleaning out 1,690 ft.

W. W. Donnelly & Young's No. 1 Middlebuster, C Sec. 11, Blk. 9, D.&S.E. Sur. ..... 7,000,000 ft. gas at 1,663 ft.; shut down 1,690 ft.; small oil show.

Moncrief, Zoch et al's No. 1 J. H. Tippett, 330 ft. from C NE line Sec. 45, Blk. 31, H.&T.C.R.R., but in Sec. 1, Blk. JH ..... Spudded and shut down.

Texas-Canadian Oil Co.'s No. 1 University, 330 ft. from N and 305 ft. from E lines, Sec. 4, Blk. 33 ..... Show gas 1,250 ft.; shut down 1,275 ft.

J. D. Wheeler's No. 1 State Land, 744 ft. S and 1,250 ft. E from SE cor. Sec. 73, Blk. 1, O.&G.N.R.R., but in Vacancy Strip ..... Shut down 320 ft.

CULBERSON COUNTY

Deep Rock Oil Co.'s No. 2 Seay, 200 ft. N and 250 ft. E of CSL Sec. 20, Blk. 59, T.&P. Sur. ..... Drlg. 160 ft.

W. S. Hillyer's No. 1 McGregor, C NW Sec. 14, Blk. 81 ..... Shut down 385 ft.

Hickey & Stiver's No. 1, C. O. Finley, 660 ft. N and 1,980 ft. W. Sec. 20, Blk. 82 ..... Hole full water; small oil show 1,331 ft.; pipe set 1,418 ft.; shut down 1,660 ft.

Scott & Dittman's No. 1 Miller, 1,160 ft. N and 2,480 ft. E Sec. 1, Blk. 97, Public School Land ..... Rainbow 1,056 ft.; 300 ft. sulphur water 1,725 ft.; shut down for casing 1,767 ft.

DAWSON COUNTY

Magnolia Petroleum Co.'s No. 1 W. A. Jetter, C Sec. 1, Blk. 34, Twp. 4-N ..... Top salt 1,650 ft.; set 10-in. casing 1,815 ft.; total depth 2,412 ft.

ECTOR COUNTY

Pennsylvania Drlg. Co.'s No. 1 W. E. Connell, C NE Sec. 7, Blk. B-16 ..... Location.

EL PASO COUNTY

Sillix et al's No. 1 W. D. Malone, Sec. 46, James M. Day Sur. ..... Set 12½-in. casing 1,010 ft.; shut down 1,010 ft.

FISHER COUNTY

Bickerstaff et al's No. 1 McWhirter, 2,640 ft. E and 150 ft. N of SW cor. of Sec. 295, Blk. 2, H.&T.C. ..... Shut down 1,328 ft.

Cranfill & Reynolds' No. 1 J. L. Sharp, C NE of SW Sec. 207, B.B.B.&C. Sur. ..... Drlg. 1,865 ft.

Cranfill & Reynolds' No. 1 E. G. Young, C of NW of SW of Sec. 199, B.B.B.&C. Sur. ..... Total depth 3,155 ft., salt water; plugged back to 2,905 ft. and shot 100 qts. at 2,835-90 ft.

Dunnegan Bros.' No. 1 T. Henry, 330 ft. N and E of SE cor. Sec. 21, George W. Burdett Sur. No. 322, but in Sec. 4, Robert Hibbitt Sur. No. 331 ..... Location.

Hucony Gas Co.'s No. 1 D. F. Maberry, 1,078 ft. S and 188 ft. W of NE cor. Elijah Bell Survey No. 327 ..... Hole full salt water 2,735 ft.; shut down 2,840 ft.

Roeser & Pendleton's No. 1-B Decker, 455 ft. N and 330 ft. E of SW line of N 100 ac. of W 160 ac. of N 320 ac. of Sec. 8, Blk. R. W. E. Richardson Sur. ..... Drlg. 3,270 ft.

Sun et al's No. 2 Young, Sec. 208, Blk. 1, C NE SE, B.B.B.&C. Sur. ..... Top pay 3,125 ft.; total depth 3,-130 ft.; made 130 bbls. 14 hrs.

Thompson et al's No. 1 Newman, 1,320 ft. N and 660 ft. W of SE cor. of SW Sec. 44, Blk. 1, H.&T.B. Sur. ..... Location.

GAINES COUNTY

Pure Oil Co.'s No. 1 A. A. Williamson, 1,650 S and 330 ft. W of NE cor. of Sec. 110, Blk. E, D.&W.R.R. ..... Ready to spud.

GLASSCOCK COUNTY

Atlas Drlg. Co.'s No. 1 Hamlin, C Sec. 7, 8, 18, 17, Blk. 32, T.&P. Sur. ..... Location.

Josey & Finchbaugh's No. 1 S. R. Cox, 1,320 ft. W or NE cor. and located on the N line of Sec. 29, Blk. 33, Twp. 4s, T.P.R.R. Sur. ..... Hole full salt water 780 ft.; hole full salt water 1,801-15 ft.; set 6-in. casing 2,607 ft.; top lime 2,602 ft.; shut down 3,272 ft.; hole full sulphur water at 3,232 ft.

Meriweather Oil Co.'s No. 2 McDowell, 1,492 ft. N and 150 ft. N of SE Sec. 35, Blk. 34, Twp. 2s, T.&P. Sur. ..... Spudding.

HOWARD COUNTY

Amerada Pet. Corp. and Rycade Oil Corp.'s No. 2 Dora Roberts, 990 ft. S and 2,240 ft. W of NE cor. Sec. 137, Blk. 29 ..... Drlg. 1,010 ft.

Amerada Pet. Corp. and Rycade Oil Corp.'s No. 3 Dora Roberts, 990 ft. S and W of NE cor. Sec. 137, Blk. 29 ..... Drlg. 955 ft.

Amerada Pet. Corp. and Rycade Oil Corp.'s No. 4 Dora Roberts, 330 ft. N and 2,310 ft. E of SW cor. Sec. 128, Blk. 29, W.&N.W. Sur. ..... Drlg. 460 ft.

Amerada Pet. Corp. and Rycade Oil Corp.'s No. 5 Dora Roberts, 330 ft. N and 2,310 ft. W of SE cor. Sec. 128, Blk. 29 ..... Spudding.

Amerada Pet. Corp. and Rycade Oil Corp.'s No. 6 Dora Roberts, 330 ft. N and 990 ft. W of SE cor. Sec. 128, Blk. 29, W.&N.W. Sur. ..... Shut down 565 ft. for water.

Andrews & McCamey's No. 1 Neal, 200 ft. S and W of NE cor. Sec. 17, Blk. 32, Twp. 1s ..... Set 6-in. casing 2,825 ft.; drlg. 3,030 ft.

Atlas Drlg. Co.'s No. 1 L. S. Hamlin, com. cor. Secs. 7, 8, 17 and 18, Blk. 32, Twp. 2n, T.&P. Sur. ..... Location.

Bristow & Merrick's No. 2 D. Roberts, 990 ft. E and 330 ft. N of SW Sec. 137, Blk. 29, W.&N.W.R.R. Sur. ..... Set 6-in. casing 1,950 ft.; drlg. 2,100 ft.

Cosden & Co.'s No. 2 Dora Roberts-D, 1,650 ft. S and 990 ft. W of NE cor. Sec. 157, Blk. 29, W.&N.W. ..... Drlg. 1,300 ft.

W. W. Donnelly et al's No. 1 Clay, SW cor. W half NE Sec. 127, Blk. 29, W.&N.W. ..... 700 ft. oil in hole from 1,919-27 ft.; 8 bbls. water 2,635-50 ft.; sulphur water 3,040 ft.; total depth 3,135 ft.; plugged back to 1,990 ft.; shot with 40 qts. at 1,907-35 ft.; swabbed 25 bbls. oil and water.

Dunnigan & Hyer's No. 3 Clay, 785 ft. N and 250 ft. E of SW cor. Sec. 126, Blk. 29 ..... Drlg. 1,375 ft.

F. H. E. Oil Co. et al's No. 7-B Dora Roberts, 330 ft. S and E of NW of Sec. 137, Blk. 29 ..... Drlg. 1,610 ft.

F. H. E. Oil Co.'s No. 8-B Dora Roberts, 2,310 ft. S and E of NW cor. Sec. 137, Blk. 29, W.&N.W. Sur. ..... Shut down 600 ft.

F. H. E. Oil Co.'s No. 9-B Dora Roberts, 1,040 ft. S and 2,310 ft. E of NW cor. Sec. 137, Blk. 29, W.&N.W. R.R. Sur. ..... Drlg. 1,741 ft.

F. H. E. Oil Co.'s No. 10-B Dora Roberts, 330 ft. S and 310 ft. E of NW cor. Sec. 137, Blk. 29 ..... Drlg. 1,331 ft.

F. H. E. Oil Co.'s No. 11-B, 1,700 ft. S and 2,310 ft. E of NW cor. Sec. 137, Blk. 29, W.&N.W. Sur. ..... Spudded and shut down.

F. H. E. Oil Co.'s No. 5-D Dora Roberts, 2,310 ft. S and 1,650 ft. E of NW cor. Sec. 136, Blk. 29 ..... Drlg. 2,640 ft.

Green Oil Co.'s No. 4 H. R. Clay, 785 ft. N and 250 ft.t W of SE cor. of Sec. 127, Blk. 29 ..... Rigging up.

Green Oil Co. et al's No. 1 J. W. Furrh, C SW cor. Sec. 11, Blk. 31 ..... Drlg. 1,932 ft.

L. C. Harrison et al's No. 1 G. M. Podge Est., SE cor. Sec. 9, Blk. 30, T-1-S, T.&P. Sur. ..... Hole full salt water 1,475-1,505 ft.; top lime 1,825 ft.; show oil 2,972-74 ft.; fishing 3,110 ft.

Henshaw Oil Corp.'s No. 1 Dora Roberts-C, 1,423 ft. S and 2,723 ft. E of NW cor. Sec. 6, Blk. 32, T-2-S, T.P. Sur. ..... Cem. 8¼-in. casing 1,996 ft.

Henshaw Oil Corp.'s No. 2-A Settles, 1,884 ft. E and 330 ft. S of NW cor. Sec. 6, Blk. 32, Twp. 2s, T.&P. Sur. ..... Drlg. 1,360 ft.

Louisiana Oil & Ref. Corp.'s No. 1 Kloh & Rumsey, 2,970 ft. E and 2,310 ft. S of NW cor. Sec. 3, Blk. 32, T-2S, T.&P.R.R. Sur. ..... Drlg. 3,150 ft.

Louisiana O. & R. Corp.'s No. 1 W. R. Settles, 2,093 ft. E and 1,432 ft. S of NW cor. Sec. 6, Blk. 32, Twp. 1s, T.&P. Sur. ..... Top pay 2,206 ft.; total depth 2,232 ft.; swabbed 1,346 bbls.

Louisiana Oil Corp.'s No. 2 Settles, 2,306 ft. E and 330 ft. S NW cor. Sec. 6, Blk. 32, Twp. 2s, T.&P. Sur. ..... Drlg. 820 ft.

Magnolia Pet. Co.'s No. 12 Dora Roberts, 1,650 ft. N and 330 ft. S of SW cor. Sec. 136, Blk. 29, W.& N. W. Sur. ..... Drlg. 400 ft.

Magnolia Pet. Co.'s No. 13 Dora Roberts, 2,440 ft. N and 1,650 ft. E of SW cor. Sec. 136, Blk. 29, W.&N.W. Sur. ..... Rigging up standard tools, 2,927 ft.

Magnolia Pet. Co.'s No. 14 Dora Roberts, 990 ft. N and 2,310 ft. W Sec. 157, Blk. 29 ..... Cem. 8¼-in. casing 2,965 ft.

Magnolia Pet. Co.'s No. 15 Dora Roberts, 2,310 ft. S and W Sec. 157, Blk. 29, W.&N.W. ..... Hole full oil and water; shut down 3,020 ft.

Magnolia Pet. Co.'s No. 16-D Roberts, 990 ft. N and 1,650 ft. E of SW cor. Sec. 136, Blk. 29, W.&N.W. Sur. ..... Drlg. 2,090 ft.

Marland Prod. Co.'s No. 11-A Clay, 250 ftt. S and 2,890 ft. W of NE cor. Sec. 139, Blk. 29, W.&N.W.R.R. Sur. ..... Set 6-in. casing 1,746 ft.

Marland Prod. Co.'s No. 4-E Chalk, 990 ft. N and 330 ft. E of SW cor. Sec. 124, Blk. 29, W.&N.W. Sur. ..... Drlg. 1,392 ft.

Marland Prod. Co.'s No. 1 Dora Roberts, SW cor. Sec. 128, Blk. 29, W.&N.W. ..... Drlg. 2,800 ft.

Marland-Texon Prod. Co.'s No. 1 Eason, 2,638 ft. S and 2,513 ft. E of NW cor. Sec. 6, Blk. 32, Twp. 2s, T.&P. Sur. ..... Drlg. 683 ft.

Marland-Texon's No. 5-A Settles, 2,310 ft. N and 330 ft. E of Sec. 135, Blk. 29 ..... Top pay 2,495 ft.; top lime 2,625 ft.; fishing 2,944 ft.

Marland & Group One Co.'s No. 6-A Settles, 2,266.5 ft. S and 2,513.2 ft. E of NW cor. Sec. 6, Blk. 32, Twp. 2s, T.&P. Sur. ..... Drlg. 1,285 ft.

Phillips Pet. Co.'s No. 1 J. Thomas, 330 ft. N and W of SE cor. of Sec. 13, Blk. 33, T-1-N, T.P. Sur. ..... Drlg. 1,440 ft.

Pure Oil Co.'s No. 7 Chalk, 990 ft. N and 330 ft. W of SE cor. Sec. 125, Blk. 29 ..... Rig.

Schermerhorn Oil Co.'s No. 4 Roberts, 990 ft. S and W of NE cor. Sec. 157, Blk. 29 ..... Drlg. 870 ft.

Sun Oil Co.'s No. 4 Settles, 330 ft. W and 1,650 ft. N of SE cor. Sec. 135, Blk. 29, W.&N.W. Sur. ..... Drlg. 1,100 ft., No. 5 rig.

Texon O. & L. Co.'s No. 1 Quinn, 330 ft. N and W of SE cor. Sec. 11, Blk. 34, Twp. 1s ..... Drlg. 2,440 ft.

Ward Oil Co.'s No. 3 D. Roberts, 2,310 ft. N and E of SW cor. Sec. 137, Blk. 29 ..... Drlg. 1,450 ft.

Witherspoon & Glasscock's No. 1 Settles, 330 ft. S and 2,970 ft. W, Sec. 6, Blk. 32, T.&P. Sur. ..... Spudded with machine and shut down.

HUDSPETH COUNTY

American Land Co.'s No. 1 Lockhart and Roseborough, C SE Sec. 5, School Blk. 21 ..... Total depth 260 ft.; rebuilding rig.

California Co.'s No. 1 University, 3,821 ft. N and 2,554 ft. E of SW cor. Sec. 19, Blk. E ..... Total depth 150 ft.

Western States Oil Co.'s No. 1 Moore, C SE Sec. 16, Blk. 71, Twp. 6, T.&P. Sur. ..... Straightreaming 2,700 ft.; total depth 2,740 ft.

Western States Oil Co.'s No. 1 Gardner & Moseley, NE NW Sec. 12, Blk. 18 ..... Hole full water 2,945 ft.; underreaming 8¼-in. casing at 2,840 ft.; trying to get water shut off; shut down 3,140 ft.

IRION COUNTY

Central Oil Corp.'s No. 1 Harlan Horney, 1,170 ft. N and 450 ft. W of SW cor. Sec. 3, Blk. 3, H.&T.C. Sur. but in Strip No. 1,026 ..... Shut down 350 ft. (corrected).

Fuhrman Pet. Co.'s No. 1 J. O. Suggs, Lease 1, C SE Sec. 3,024, Blk. 24, H.&T.C. Sur. ..... Location

Fuhrman Pet. Co.'s No. 1 J. D. Suggs, Lease 2, C SW Sec. 3,029, Blk. 24, H.&T.C. Sur. ..... Location.

Fuhrman Pet. Co.'s No. 1 J. D. Suggs, Lease 3, C SE Sec. 3,009, Blk. 24, H.&T.C. ..... Location.

Kimbrough & Tuel's No. 1 J. M. Nutt, 1,920 ft. S. 200 ft. E of NW cor. Sec. 5, Gonzales Co. School Land ..... Set 6-in. casing 1,360 ft.; show oil and gas; shut down 1,400 ft.

Mertzon Oil Co.'s No. 1 Roach, Sec. 24, 1,380 varas W, 485 varas S of NE cor. Mat Roach Sur. ..... Oil show 1,622-30 ft.; shot with qts. 1,522-30 ft.; hole full water; shut down 2,202 ft.

Signal Oil Co.'s No. 1 Suggs, Sec. 9, Blk. H. T.C.R.R. Su ..... Top salt 805 ft.; hole full sulphur water 1,865 ft.; shut down 2,025 ft.

Sun Oil Co.'s No. 1 Williams, 1,190 ft. E and 230 ft. N of SW cor. Sec. 39, Blk. 21, H.&T.C.R.R. Sur. ..... Set 6-in. casing 2,123 ft.; shut down 2,325 ft.

F. E. Webb et al's No. 1 J. M. Nutt ..... Shut down 2,030 ft.

Wesley West et al's No. 1 J. D. Suggs, SE NW SE Sec. 19, Blk. 7, H.&T.C. Sur. ..... Top pay 3,368 ft.; total depth 3,383 ft.; swabbed 25 bbls. oil and 40 bbls. water, 35.8 gravity oil.

C. J. Wrightsman's No. 1 Sawyer, 1,320 ft. from N and W lines Sec. 3,032, Blk. 24, H.&T.C. ..... Location.

JEFF DAVIS COUNTY

J. K. Hughes Dev. Co.'s No. 2 Means, 1,622 ft. N line 600 ft. W line Sec. 345, Blk. 4, H.&T.C. ..... Show gas 3,271 ft., black lime; shut down for pipe; slight show gas.

JONES COUNTY

Anna Belle Oil Co.'s No. 1 Bickley, 330 ft. S and E of NW cor. SE NE Sec. 50, Blk. 18, T.&P. Sur. ..... Rig.

Atkinson & Sandifer's No. 1 Hudspeth, 300 ft. S of CNL Sec. 22, Miles Sur. ..... Cem. 8-in. casing 2,335 ft.

W. G. Clark et al's No. 1 J. T. Thomas, 250 ft. S and 103 ft. W of extreme NE cor. Sec. 13, Blk. 19 ..... Drlg. 1,300 ft.

Cranfill & Reynolds and others' No. 1 Bickley, 510 ft. N and 150 ft. E of SW cor. Sec. 50, Blk. 18, T.&P. Sur. ..... Drlg. 2,255 ft.

Cosden & Herbert Oil Co.'s No. 1 Bickley, 320 ft. N and 319 ft. E of SW cor. S half of NW Sec. 50, Blk. 18, T.&P. Sur. ..... Rig.

Cosden, Herbert et al's No. 6 Bickley, 330 ft. S and 1,278 ft. W of NE cor. S half NW Sec. 50, Blk. 18, T.&P. Sur. ..... Location.

E. L. Evans' No. 1 S. W. King, Manuel Bueno Sur. No. 197 ..... Shut down 2,015 ft.

Hucony Gas Co.'s No. 1 Thomas, 330 ft. N and W of SE cor. E 40 ac. of S 80 ac. of J. Boston Sur. No. 276-A-19 ..... Location.

McMan Oil & Gas Co.'s No. 1 Bickley, 2,320 ft. W and McNeeley et al's No. 1 Roscoe Bland, 1,175 ft. N and 240 ft. W of SE cor. Sub-Division 20, A-164, DeWitt Co. School Land ..... Rig.

Phillips Pet. Corp.'s No. 5 J. C. Mason, 990 ft. S and 330 ft. W of NE cor. W half NE Sec. 18, Blk. 19, T.&P. Sur. ..... Location.

Richardson Bros.' No. 1 Mrs. M. A. Martin, C E 80 acres, N half Sec. 13, J. Weihl Sur. No. A-468 ..... Shut down 722 ft.

Roberts Oil Corp.'s No. 6 Grayson, 330 ft. S and W of NE cor. of Lease, Sec. 13, Blk. 19, T.&P. Sur. ..... Location.

Sinclair O. & G. Co.'s No. 2 Buckley, 975 ft. S, 320 ft. E of NW cor. N half NE cor. Sec. 50, Blk. 18, T.&P. R.R. Sur. ..... Shot with 25 qts. 2,505-13 ft.; cleaning out.

W. G. Stough et al's No. 1 J. P. Willis, J. C. Patterson Sur. No. 2 ..... Shut down 1,740 ft.

The Texas Company's No. 1 Camp, 330 ft. N and 290 ft. E of SW cor. 194.5-acre tract in Sec. 13, Blk. 19, T.&P.R.R. Sur. ..... Drlg. 2,341 ft.

The Texas Company's No. 3 Laura Carter, 330 ft. S and W of NW cor. Carter 173.5-acre tract, Sec. 13, Blk. 19, T.&P. Sur. ..... Location.
Woods & Williams' No. 1 M. A. Parr, about 500 ft. S and E of NW cor. G. A. Kirkland Sur. A-507 ..... Drlg. 1,800 ft.

KENT COUNTY

J. S. Cosden & Co.'s No. 1 Wallace, Sec. 56, Blk. 98, H.&T.C. Sur. ..... Shut down for orders 3,555 ft.

KNOX COUNTY

Deep Rock Oil Co.'s No. 1 Moore ..... Shut down 2,495 ft. for repairs.
Deep Rock Oil Co.'s No. 1 Big Four, 1,270 ft. S and 2,500 ft. W of NE cor. Sec. 21, Blk. 4 ..... Shut down 4,516 ft.; hole full of water.

LOVING COUNTY

Lockhart & Co.'s No. 2 Allen, 330 ft. NW and 330 ft. NE Sec. 82, Blk. 33, H.&T.C. ..... Top salt 722 ft.; drlg. 3,073 ft.
Lockhart & Co.'s No. 1-A Lepp, Sec. 85, Blk. 33 ..... Set 6-in. casing 3,950 ft.; oil show 4,095--4,135 ft.; 250,000 ft. gas cleaning out 4,178 ft.; 2,000,000 ft. gas 4,172-75 ft.; top black lime 4,095 ft.; shut down 4,290 ft.; flows 20 bbls. daily.

MENARD COUNTY

Carpenter & Robbins' No. 1 Kothman, NW cor. SW SW Sec. 22 ..... Shut down 600 ft.
J. C. Barnett and T. H. Drake's No. 1 Callan City Co. Ranch, Sec. 22 ..... Show oil 1,857 ft.; shut down 2,061 ft.
Panhandle O. & R. Co.'s No. 1 G. P. Eckardt, C SW Sec. 10, Blk. 2, TW.N.G.R.R. Sur. ..... Top pay 3,001 ft.; 2,000 ft. fluid in hole; run 5 3/16-in. casing 3,013 ft.; hole full sulphur water 3,030 ft.; drlg. 3,225 ft.
Sorrels & Jackson's No. 1 F. Wilhelm, C NE Sec. 6, Blk. C, Brooks & Burleson Sur. ..... Shut down 290 ft.; bldg. new rig.

MIDLAND COUNTY

Shoup et al's No. 1 Roy Parks, C NW Sec. 34, Blk. 41, Twp. 2s, T.&P. ..... Top salt 1,700 ft.; cem. 8 1/4-in. casing 2,770 ft.; show oil 3,830 ft.; shut down 4,004 ft.; cleaning out.

MITCHELL COUNTY

California Co.'s No. 6 Foster, Lease 1, 990 ft. N and 2,310 ft. E of SW cor. Sec. 6, Blk. 29, Twp. 1s, T.&P. Sur. ..... Location.
E. P. Campbell et al's No. 1 Pond, 1,065 ft. W, 660 ft. N of SE cor. Sec. 79, Blk. 27, T.&P. Sur. ..... Shut down 685 ft.
Hucony Gas Co.'s No. 1 C. Weichsel, 2,310 ft. N and 990 ft. E of SW cor. Sec. 78, Blk. 26, T.&P. Sur. ..... Top lime 1,342 ft.; drlg. 2,625 ft.
Teas & Wheeler's No. 1 Radford, 1,320 ft. N and W of Sec. 1, Blk. 27, T.&P. Sur. ..... Drlg. 1,800 ft.

NOLAN COUNTY

Herbert Oil Co.'s No. 1 Pepper, C of N half Sec. 32, Blk. 22, T.&P. Sur. ..... Show gas 3,160 ft.; hole full sulphur water 3,190-3,202 ft.; shut down 3,303 ft.
W. E. O. & R. Co.'s No. 1 Allyn, 660 ft. E and 1,720 ft. N of SW cor. Sec. 43, Blk. 20, T.&P. Sur ..... Drlg. 300 ft.

PECOS COUNTY

Alexander & Lyle's No. 1 Myrtle Sellman, C SW SE Sec. 20, Blk .2, T.C. Ry. Sur. ..... Top salt 814 ft.; top lime 1,602 ft.; 3,400,000 ft. gas from 1,611-26 ft.; spraying very little oil; shut down.
George Anderson's No. 1 University, C Sec. 11, Blk. 17 .... Top salt 1,030 ft.; shut down 1,880 ft.
California Co.'s No. 1 Smith, Lease No. 5, 1,010 ft. S and W of NE cor. Sec. 16, Blk. 194, G.C.&S.F. ..... Location.
M. C. Dibble & Hale's No. 1 Bonebrake, Sec. 115, Blk. 8, H.&G.W. Sur., elev. 2,555 ft. ..... Top lime 1,305 ft.; set 6-in. casing 1,610 ft.; shut down 2,004 ft.
Ditto Oil Co.'s No. 1 J. M. Montgomery, Sec. 104, Blk. 331, A16,387 ..... Shut down 660 ft.
Mauch & Kroger's No. 1 Holmes, Sec. 5, Blk. 178, T.C. Sur. ..... Shut down 1,010 ft.
McCarty Oil Co.'s No. 1 Bennett, 960 ft. S and E of NW cor. Sec. 592, G.C.&S.F. Sur. ..... Shut down 750 ft.
Mid-Kansas Oil & Gas Co.'s No. 11 Yates-C, 250 ft. S and 845 ft. E of NW cor. Sec. 60, Blk. 1, I.&G.N. .... Running 8-in. casing 1,120 bbls.
Pecos Valley Oil Co.'s No. 1 fee, Sec. 22, Blk. 16, H.&G.N. Sur. ..... Set 8-in. casing 1,015 ft.; top salt 1,115 ft.; top pay 1,626-28 ft.; flows 100 bbls. of 37 gravity oil daily.
B. J. Spikes' No. 1 George Brown ..... Shut down 700 ft.
Rio Pecos Oil Co.'s No. 1 Yates, 330 ft. S and E of NW cor. Sec. 543, Blk. 1, H.&G.N. ..... Shut down 775 ft.
Roxana Pet. Corp.'s No. 3 Smith-D, 330 ft. S and E of NW cor. of S half of Sec. 24, Blk. 194, G.C.&S.F. Sur. .. Drlg. 365 ft.
Schumaker et al's No 1 Williams et al, 330 ft. N of middle of S line, Sec. 1, Blk. 117, G.C.&S.F. ..... Spudded and shut down.
Southern C. O. P. Co.'s No. 1 Scharbauer Cattle Co., SW cor. Sec. 21, Blk. 134, T.&S.L. Sur. ..... Show gas 1,455-60 ft.; drlg. plug 2,964 ft.
Talbot & Ditman's No. 1 Unsicker, 1,320 ft. from E and 660 ft. from S lines, Sec. 25, Blk. 10, H.&G.N. ..... Spudded and shut down.
Transcontinental Oil Co.'s No. 1 University, NE NW SW Sec. 18, Blk. 18 ..... Top lime 1,155 ft.; shut down 4,130 ft.
Yates Ranch Dev. Co.'s No. 1 Yates C, Lot 51, Sec. 70, Blk. 1, H.&G.N.R.R. Sur. ..... Location.
World Oil Co.'s No. 1 Kloh, Sec. 47, Blk. 45, Twp. 8, T.P.R.R. Sur., elev. 2,810 ft. ..... Shut down 3,105 ft.

PRESIDIO COUNTY

Eastland Oil Co.'s No. 1 Smith, Cen. Sec. 17, Certificate 463, or Blk. 351, G.C.&S.F.R.R. ..... Spudded and shut down.
Phillips Pet. Co., Empire G. & F. Co., Delmar Oil Co. and C. E. Miller's No. 1 Tootle Est., C NE Sec. 75, Blk. 3, D.&P.R.R. Sur. ..... Fishing 690 ft.
L. C. Brite's No. 1 Lee, Sec. 50, Blk. 12, G.H.&S.A. Sur., center of section ..... Shut down 2,785 ft.

REAGAN COUNTY

Empire Gas & Fuel Co.'s No. 1 Sawyer Cattle Co.-A 4,160 ft. from S line and 330 ft. from W line of Sec. 18, Blk. A, Leonard G. Gee Sur. ..... Top salt 910 ft.; running 8 1/4-in. casing 2,516 ft.
Texon O. & L. Co.'s No. 1-B University Group 1 ..... Top pay 6,250 ft., hole full of oil; well made two small heads; drlg. 8,490 ft.
Skelly Oil Co.'s No. 3 University, 2,310 ft. N and E of SW cor. Sec. 33, Blk. 8, University Land ..... Top salt 1,320 ft.; underreaming 8 1/4-in. casing 2,815 ft.

REEVES COUNTY

D. F. Davis et al's No. 1 H. C. McCart, 300 ft. S and 200 ft. W of NE cor. S half NW Sec. 26, Blk. C-18 ..... Shut down 25 ft.
Exploration Co.'s No. 1 A. A. Kinney, 1,500 ft. W of NE cor. Sec. 26, Blk. C-18, Public School Land, elev. 2,847 ft. ..... Total depth 2,900 ft.; shut down.
Dr. Kitsis et al's No. 1 Kloh & Rumsey, 330 ft. N and W of SE cor. Sec. 5, Blk. 54, Twp. 5, T.&P. Sur. ..... Drlg. 780 ft.
David R. Thompson's No. 1 A. A. Eddins ..... Swedging csg. 5,658 ft.; pulling 5-in. csg.
Robert Penn et al's No. 1 Bowles, 2,310 ft. SW of NE cor. Sec. 36, Blk. 50, Twp. 8, T.&P.R.R. Sur. ..... Location.
World Oil Co.'s No. 1 A. L. Duff, 1,500 ft. from S. 850 ft. from NE. R. S. Johnson Sur. No. 68 ..... Elev. 2,774 ft.; total depth 4,515 ft.; plugged back 4,223 ft.; hole full fluid, slopping 1 bbl. of oil daily.

RUNNELS COUNTY

Agnew & Sons, Inc., No. 1 R. R. Russell, in Mrs. H. Holbien Sur. No. 13 1/2 ..... Show oil and gas 3,990 ft.; hole full water 4,025 ft.; plug back to 4,001 ft.; shot with 100 qts. 3,975-4,001 ft.; cleaning out.
Boyce et al's No. 1 E. O. Lange, 2,300 ft. S and 6,900 ft. W of NE cor. Austin & Williams Sur. No. 262 ..... Location.
Foster et al's No. 1 Currie, 1,866 ft. SE of NW line, 335 ft. SW of NE L. Gray Carroll Sur. ..... Location.
R. D. Hamilton et al's No. 1 A. Spill, 1,320 ft. S and W of NE cor. A. Spill 891 acres, out of Thomas R. Webb Sur. No. 358 ..... Shut down 100 ft.
McLean et al's No. 1 G. W. Clayton, 150 ft. N line, 270 ft. from W line Sec. 135, E.T.R.R. ..... Shut down 1,185 ft.
Nourse & Tilton's No. 1 R. A. Cramer, 200 ft. S, 600 ft. E of NW cor. G.C.&S.F. Sur. No. 2 ..... Drlg. 110 ft.
R. B. Summers et al's No. 1 J. W. Reese, M. J. Parramore Sur. 24 ..... Shut down 1,650 ft.
Union Oil Co. of Nevada's No. 1 W. E. Allen, 1,000 ft. N and W of SE cor .Sec. 1, H.E.&W.T. Sur. ..... Shut down 1,365 ft.
Vacuum Oil Co.'s No. 1 Brevard, 2,150 ft. N and 302 ft. E of SW cor. Lot 21, D. Diaz Sur. No. 532 ..... Location.

SCHLEICHER COUNTY

J. F. Long and O. C. Long's No. 1 W. H. Williams, NE cor. Sec. 28, H.E.&W.T.R.R. Sur. ..... Shut down 275 ft.

SCURRY COUNTY

Landreth Prod Co.'s No. 1 Hillmer, 330 ft. N and E of Sec. 75, Blk. 25, H.&T.C.R.R. Sur. ..... Top salt 870 ft.; hole full sulphur water 2,740 ft.; drlg. 3,315 ft.
I. B. Mims et al's No. 1 J. J. Koonsman, Sec. 216, Blk. 2, H.&T.C. Sur. ..... Spudded and shut down (corrected).
G. E. Dieckman and R. B. Pender et al's No. 1 F. C. Davis, 1,000 ft. N and 1,770 ft. W of SE cor. of Sec. 275, Blk. 2, H.&T.C. Sur. ..... Underreaming casing 900 ft.

STERLING COUNTY

F. & G. Oil Co.'s No. 1 W. L. Foster, C SE Sec. 20, Blk. 12, S.P.R.R. Sur. ..... Show oil 1,296-98 ft. and 1,356-58 ft.; total depth 1,420 ft.; hole full sulphur water.

STONEWALL COUNTY

Sun Oil Co.'s No. 1 Reynor, 346 ft. S and W NE cor. Sec. 20, Blk. B, H.&T. C. ..... Drlg. 3,275 ft.

SUTTON COUNTY

Phillips Pet. Co.'s No. 1 A. G. Holman, 2,310 ft. S and 330 ft. W NE cor. Sec. 25, C.C.S.D.&N.G.R.R. Sur. .... Fishing 5,770 ft.
Phillips Pet. Co.'s No. 1 Cusanbary, 2,310 ft. E and 330 ft. S of NW cor. Sec. 39, C.C.S.D.&R.G.N.G. Sur. ..... Drlg. by tools 195 ft.

TAYLOR COUNTY

Burnham et al's No. 1 A. M. Y. X. ..... Drlg. 825 ft.
Grisham-Hunter Oil Corp.'s No. 1 T. L. Stevens, 220 ft. S and E of NW cor. Sec. 53, Blk. 19, T.P. Sur. ..... Shut down 2,650 ft.; no show in lime 2,580-2,625 ft.
Hurley Oil Co.'s No. 1 Mrs. A. R. Payne, 330 ft. N and E of SW cor. E 80 acres of NW Sec. 52, Blk. 19 ..... Drlg. 2,348 ft.; hole full water 2,145-62 ft.

TERRELL COUNTY

Big Bend Oil Co.'s No. 1 Bassett, C NW Sec. 155, Blk. D, M.-K.-T.R.R. ..... Spudded and shut down.
Keck Pecos Trust Co.'s No. 1 Hamilton, C Sec. 6, Blk. D-7, E.L.&R.R. Sur. ..... Shut down 1,740 ft.
Mrs. J. B. McPhee's No. 1 Sam Belt, Cen. Sec. 78, Blk. D-7, E.L.&R.R. Sur. ..... Location.
Milham Exploration Co.'s No. 1 Bassett, Sec. 76, Blk. Y, W. E. Robertson Sur. ..... Cem. 6 5/8-in. casing 3,986 ft.; cem. cave 4,140 ft.; drlg. 4,375 ft.
Woodley & Jones No. 1 Pankenham, C SE NW Sec. 43, Blk. B-2, C.C.S.D.&N.G.R.R. Sur. ..... Shut down 150 ft.

TERRY COUNTY

Kingsland O. & P. Co.'s No. 1 Brownfield, C NW SW SW Sec. 7, Blk. 1-A, E.L.R.R. Sur. ..... Underreaming 5 3/16-in. casing 4,430 ft.

TOM GREEN COUNTY

Collins et al's No. 1 Jones, CSL Sec. 646, Shaffer Sur. .... Shut down 1,800 ft.
Fitzgerald & Tallaferro's No. 1 Bennett, C SW Sec. 1,628, E. H. Ringer ..... Shut down 1,920 ft.
F. P. Green et al's No. 1 fee, 575 ft. from N and 1,450 ft. from W lines Sec. 165, District 11, S.P.R.R. Co. Sur. ..... Shut down 1,066 ft.; rigging up new machinery.
McLaughlin & Ridge's No. 1 R. Q. Holder, 3,140 ft. N and 80 ft. W SE cor. J. P. Parker Sur. (3,000-ft. test) ..... Show gas 1,757-59 ft.; shut down 3,005 ft.; hole full water 2,986 ft.
Tulsa Oil Co.'s No. 1 Adams, C SW Sec. 163, Blk. 11, S.P.R.R. Sur. ..... Shut down 1,050 ft.

UPTON COUNTY

Champlin Oil & Ref. Co.'s No. 4 J. F. Lane, 990 ft. from S, 330 fet. From W line of SE Sec. 2, G.C.&S.F. Sur. .. Straightreaming 1,972 ft.; 800 ft. fluid in hole, 90 per cent water.
Gulf Prod. Co.'s No. 7 J. F. Lane, 990 ft. N and 326 ft. W of most southerly SE cor. of their 160-acre tract Sec. 3, G.C.&S.F. Sur. ..... Top salt 475 ft.; 250,000 ft. gas 2,700 ft.; setting 10-in.; drlg. 2,025 ft.; 800 ft. oil in hole.
Keck Investment Co.'s No. 1 H. L. McClintic, 330 ft. S and W NE cor. Sec. 206, Blk. F, C.C.S.D.&R.N.G. Sur. ..... Top salt 1,100 ft.; top lime 2,725 ft.; set 10-in. casing; drlg. 2,755 ft.; gas show 2,700 ft.
Texas & Pacific C. & O. Co.s No. 12 Lane-A, 1,650 ft. N and 2,310 ft. E of SW cor. Sec. 5, G.C.&S.F. Sur. .. Location.

VAL VERDE COUNTY

Independent Operators' No. 1 Whitehead, SE SE Sec. 20, Blk. 4, I.&G.N. Sur., elev. 1,175 ft. ..... Shut down 4,480 ft.
O. O. Owens' No. 1 Mills, Sec. 128, Blk. 1, I.&G.N. Sur., elev. 2,130 ft. ..... Gas sand 2,491-2,520 ft., tested 125,750 ft. gas; reset 8-in. 2,511 ft.; shut down 4,210 ft.
Producers Oil Co. et al's No. 1 Everett Bros., 2,310 ft. S and 330 ft. E of NW cor. Sec. 40, Blk. DB, C.C.S.D.R.G.N.G. Sur. ..... Shut down 735 ft.
Dyar Brothers et al's No. 1 Wilson, 6,830 ft. N NE cor. Sec. 1, T.&P. Sur., thence 1,680 ft. E Sec. 115, Blk. E, G.C.&S.F. Sur. ..... Show oil and gas 1,055 ft.; shut down 1,400 ft.
Valvert Oil Corp.'s No. 1 Bassett, C NE Sur. 47, Blk. Y. .. Set 15 1/2-in. casing 767 ft.; fishing 1,204 ft.

WARD COUNTY

E. B. Lovelace et al's No. 1 Redman, 1,980 ft. NE of SW line and 1,980 ft. SE of NW line, Sec. 162, Blk. 34, H.&T.C.R.R. ..... Spudding and shut down.
Prairie Oil & Gas Co.'s No. 1 Sealy Estate, 1,320 ft. S and W Sec. 95, Blk. A, G.M.M.B.&A. Sur. ..... Top salt 1,073 ft.; 5,000,000 ft. gas 2,526 ft.; gas decreased to 2,000,000 ft. at 2,687 ft.; hole full sulphur water 3,127-36 ft.; drlg. 3,138 ft.
Rector Oil Co.'s No. 1 Johnson, 1,150 ft. NW, 5,610 ft. NE, Sec. 10, Blk. 32, H.&T.C. ..... Top salt 745 ft.; drlg. 2,096 ft., sandy lime.
Shipley et al's No. 1 Hazlett, 2,310 ft. NE and 2,310 ft. SE Sec. 17, Blk. 5, H.&T.C. ..... Top salt 727 ft.; sand pay 2,480-81 ft.; flowing about 100 bbls. daily.
Talbot, Dittman & Atlantic O. P. Co.'s No. 1 Dorr, 1,320 ft. from SE line and 660 ft. from SW line of Sec. 9, Blk. 5, H.&T.C. R. R. Sur. ..... Shut down 670 ft. for casing.

WINKLER COUNTY

Anderson et al's No. 1 Hendricks, NW NE SE Sec. 3, Blk. B-12 ..... Drlg. 900 ft., red bed.
Atlantic O. P. Co. et al's No. 2 Daugherty, 2,310 ft. N and E of SW cor. Sec. 3, Blk. 74, Public School Land .. Top lime 2,668 ft.; cem. 8 1/4-in. casing 2,673 ft.; coring 3,094 ft.; spray oil 2,968-69 ft.
Amerada Pet. Corp.'s No. 3 Cowden, 1,320 ft. S and 1,650 ft. E of NW cor. Sec. 3, Blk. B-12, School Land .. Drlg. 2,300 ft.
Amerada Pet Corp.'s No. 1 L. Daugherty, 2,310 ft. N and W of SE cor. Sec. 3, Blk. 74, Public School Land .. Top lime 2,648 ft.; set 8-in. casing 2,653 ft.; oil show 2,729 ft.; total depth 3,097 ft., 46,000,000 ft. gas; oil show 2,920-28 ft.
Amerada Pet. Corp.'s No. 2 Daugherty, SW cor. SE Sec. 3, Blk. 74 ..... Drlg. 1,550 ft.

Amerada Pet. Corp.'s No. 3 Daugherty, NW cor. NE SE Sec. 3, Blk. 74 ..... Rigging.
V. T. Bolin et al's No. 2 Brown, 2,000 ft. S and W of NE cor. Sec. 4, Blk. B-5, Public School Land ..... Shut down 210 ft., water.
Barnsdall Oil Corp.'s No. 1 Tobe Morton, 330 ft. N and E of SW cor. Sec. 26, Blk. B-12 ..... Testing for crooked hole; total depth 2,874 ft.

Barnsdall Oil Corp.'s No. 2 Tobe Morton, 1,650 ft. N and 330 ft. E of SW cor. Sec. 26, Blk. B-12 ..... Set 12½-in. casing 547 ft.; shut down 1,094 ft.

Barnsdall Oil Corp.'s No. 3 Tobe Morton, 990 ft. N and 330 ft. E of SW cor. Sec. 26, Blk. B-12 ..... Cellar.
Cranfill & Reynolds' No. 1 Hendricks-F, 660 ft. S and 2,310 ft. E of NW cor. Sec. 16, Blk. 26 ..... Top salt 1,985 ft.; total depth 2,900 ft.

Cranfill Bros. & Pickrell's No. 1 Hutchins, 2,310 ft. N and 330 ft. E of SW cor. Sec. 47, Blk. 26 ..... Top lime 2,280 ft.; drlg. 3,035 ft. lime; oil show 2,930 ft.; 400 ft. oil.

Culberson Bros.' No. 1 Hendricks, 1,650 ft. N and W of SE cor. Sec. 40, Blk. B-5, School Land ..... Top lime 2,270 ft.; cem. 8-in. casing 2,272 ft.; rigging up standard tools.

Empire Gas & Fuel Co.'s No. 2 Daugherty, 330 ft. N and 2,310 ft. E of SW Sec. 3, Blk. 74 ..... Cem. 12½-in. casing 262 ft.; drlg. 1,250 ft.

Empire Gas & Fuel Co.'s No. 3 Daugherty, 330 ft. N and 990 ft. E of SW cor. Sec. 3, Blk. 74 ..... Cem. 12½-in. casing 251 ft.; drlg. 595 ft.

Empire Gas & Fuel Co.'s No. 1-B Daugherty, 2,310 ft. S and 990 ft. W of NE cor. Sec. 3, Blk. 74 ..... Drlg. 562 ft.
Gulf Prod. Co.'s No. 2 O'Brien, NW cor. Sec. 31, Blk. F.. Total depth cem. 8¼-in. casing 1,841 ft.

Gulf Prod. Co.'s No. 3 O'Brien, Sec. 31, Blk. F ..... Drlg. 1,378 ft.
Gulf Prod. Co.'s No. 1 Ida Hendricks, SE cor. NW, Sec. 44, Blk. 26 ..... Drlg. 1,890 ft.
Independent O. & G. Co.'s No. 3 McCabe, 990 ft. S and 2,310 ft. W of NE cor. Sec. 36, Blk. B-5, School Land.. Top salt 950 ft.; top lime 2,296 ft.; oil show 2,515 ft.; rigging up standard tools 2,831 ft.

Magnolia Pet. Co.'s No. 1 Scarborough, 2,310 ft. S and 990 ft. E Sec. 1, Blk. C-22 ..... Top salt 1,122 ft.; gas show 2,840-45 ft.; rig burned.

Marland Oil Co.'s No. 1 Tobe Morton, SE cor. Sec. 27, Blk. B-12 ..... Cem. 12½-in. casing 492 ft.
Marland Oil Co.'s No. 2 Tobe Morton, 990 ft. N and 330 ft. W of SE cor. Sec. 27, Blk. B-12 ..... Cellar.
May Prod. Co.'s No. 1 Hendricks, 1,320 ft. N and 2,310 ft. W of SE Sec. 34, Blk. 26, Public School Land..... Top lime 2,449 ft.; shut down 2,920 ft.; hole full oil; top pay 2,769 ft.

Prairie Oil & Gas Co.'s No. 2 Cowden, 1,320 ft. N and 330 ft. E of SW cor. Sec. 3, Blk. B-12 ..... Cem. 8¼-in. casing 2,518 ft.; top lime 2,515 ft.; gas show 2,539 ft.; top pay 2,725 ft.; drlg.

Prairie Oil & Gas Co.'s No. 3 Cowden, 2,200 ft. N and 990 ft. E of SW cor. Sec. 3, Blk. B-12 ..... Drlg. 2,504 ft.
Prairie Oil & Gas Co.'s No. 1 Leck, 330 ft. S and 2,310 ft. E of NW cor. Sec. 16, Blk. 74 ..... Rigging up standard tools.
Prairie O. & G. Co.'s No. 2 Leck, 330 ft. S and 2,310 ft. W of NE cor. Sec. 16, Blk. 74 ..... Rig.
Prairie Oil & Gas Co.'s No. 1 Tobe Morton, 330 ft. N and 1,650 ft. W of SW cor. Sec. 27, Blk. B-12 ..... Rig.
Roxana-The Texas Company's No. 6-A Cowden, 1,320 ft. S and 990 ft. E of NW cor. of Sec. 3, Blk. B-12, School Land ..... Top lime 2,536 ft.; cem. 8¼-in. casing 2,538 ft.

Roxana Pet. Co.'s No. 1 Daugherty, 2,310 ft. S and W of NE cor. Sec. 3, Blk. 74 ..... Total depth 609 ft.; cem. 12½-in. casing 528 ft.

Roxana Pet. Co. et al's No. 2 Lum Daugherty., 2,310 ft. S and 1,650 ft. W of NE Sec. 3, Blk. 74 ..... Total depth 240 ft.; cem. 12½-in. casing.

Simms Oil Co. and Southwest O. P. Co.'s No. 1 George Sealey, 2,434 ft. S and 330 ft. W of NE cor. Sec. 50, Blk. F ..... Rigging up rotary.
Southern C. O. P. Co.'s No. 3 Hendricks T-67-2-D, 1,650 ft. S and 330 ft. W of Sec. 28, Blk. 26 ..... Cem. 12½-in. casing 468 ft.; top lime 2,639 ft.; drlg. 2,900 ft.

Southern C. O. P. Co. and Westbrook Thompson's No. 4 Hendricks T-88-B, 330 ft. S and 1,320 ft. E NW cor. Sec. 4, Blk. B-12, Public School Land ..... Location.
Southern C. O. P. Co.'s No. 3 Hendricks T-88-D, 1,320 ft. N and W of SE cor. Blk. B-12, Public School Land ..... Location.
Southern C. O. P. Co. and Westbrook-Thompson's No. 3 Hendricks T-88-T, Sec. 34, Blk. 26, Public School Land ..... Top lime 2,453 ft.; set 8-in. casing 2,473 ft.; drlg. 3,165 ft.

Southern C. O. P. Co. and Westbrook-Thompson's No. 1 Hendricks T-88-Q, 440 ft. N and 330 ft. E of SW cor. of N half Sec. 27, Blk. 26 ..... Drlg. 1,720 ft.
Southern C. O. P. Co. and Westbrook-Thompson's No. 3 Hendricks T-89-C, 2,310 ft. N and W of SE cor. Sec. 35, Blk. B-5 ..... Cem. 8¼-in. casing 2,290 ft.

TEXAS PANHANDLE WILDCATS

(Continued from Page 35)

Danciger et als' No. 1 Shaw, 1,000 ft. N and 330 ft. W SE cor. SW, Sec. 5, Blk. 1, A.C.H.&B. Sur. ..... 35,000,000 ft. gas 2,290 ft; show oil 2,610-13 ft; S.D. 2,683 ft.

Danciger O. & R. Co.'s No. 3 J. S. Morse, 330 ft. each way from NE cor. SW, Sec. 2, Blk. 26, H.&G. N.R.R. Sur. ..... 15,000,000 ft. gas 2,290-2,395 ft; cmtd. 6-in. 2,440 ft.

Delmar Oil Co.'s No. 1 F. Foster, NW cor. SW, Sec. 55, Blk. B-2, H.&G.N. Sur. ..... Show oil; 4,000,000 ft. gas 2,835-97 ft; T.D. 3,757 ft; to plug back to 2,950 ft. and shoot.

Eslick & McKinney's No. 1 Mrs. Hopkins, 330 ft. from NE, E ½ NE, Sec. 84, Blk. B-2, H.&G.N. Sur. ..... Spud.

Sines & Reiger's, formerly Eslick et als' No. 1 Mrs. J. A. Hopkins, NW cor. W 80 acres of SW, Sec. 84, Blk. B-2, H.&T.C. Sur. ..... S.D. 3,206 ft.

Get Oil Co.'s No. 1 LeFors Townsite, 765 ft. from E line and 1,397 ft. from S line, being center of Lot 16, Blk. 5 ..... Derrick.
Gulf Prod. Co.'s No. 6 J. B. Bowers-A, 330 ft. S and E of NW cor. W ½ Sec. 89, Blk. B-2, H.&G.N. Sur. ..... Drlg. 2,119 ft.
Gulf Prod. Co.'s No. 3 Holmes-A, 330 ft. N and E of SW cor. W½ SE, Sec. 87, Blk. 3, I.&G.N. Sur. ..... Top lime 2,321 ft; S.O. in G.W., 3,138 ft.

Gulf Prod. Co.'s No. 4 Holmes-A, 990 ft. N and 330 ft. E of SW cor. W ½ SE, Sec. 87, Blk. 3, I.&G.N. R.R. Sur. ..... Rig.
Gulf Prod. Co.'s No. 1 McLarty, 150 ft. N and 462 ft. W of SE cor. NE, Sec. 2, Blk. 1, A.C.H.&B. Sur. ..... Drlg. 2,480 ft.
Gulf Prod. Co.'s No. 1 Saunders, 990 ft. N and 330 ft. E of SW cor. Sec. 3, Blk. 1, A.C.H.&B. Sur. ..... Drlg. 2,350 ft.
Gardner Bros. et als' No. 1 Ball, 323 ft. from N line and 330 ft. from E line of W 186.3 acres of N½, Sec. 3, Blk. B-2, H.&G.N. Sur. ..... Flowed 85 bbls. 2,696-2,741 ft.; S.D. 2,765 ft.

Gardner, Collins et als' No. 1 Saunders, 330 ft. each way from NE cor. of S 49 acres of W 100 acres, Sec. 3, B.&B. Sur. ..... Drlg. 2,600 ft.
LeFors Pet. Co.'s No. 3 Shaw, 990 ft. S and 375 ft. E of NW cor. T. Leach Sur. ..... 30,000,000 ft. gas 2,075-2,340 ft; oil pay 2,631-43 ft; salt wtr. 2,655-60 ft; made 300 bbls. fluid 50% wtr.

LeFors Pet. Co.'s No. 8 Shaw, 288 ft. from N line and 1,091 ft from E line of T. Leach Sur. ..... U.R. 8-in. 2,420 ft.

LeFors Pet. Co.'s No. 3 J. M. Shaw, 293 ft. from N line and 271 ft. from E line of Leach Sur. ..... Rig.
LeFors Pet. Co.'s No. 4 J. M. Shaw, 1,650 ft. from N line and 375 ft. from W line, T. Leach Sur. ..... S.D. 1,600 ft.
Magnolia Pet. Co.'s No. 2 Archer, SE N½ SE Sec. 174, Blk. 3 ..... Drlg. 2,620 ft.
Magnolia Pet. Co.'s No. 3 W. Harrah, 330 ft. from NE cor. NW, Sec. 150, Blk. 3, I.&G.N. Sur. ..... Rig.
Magnolia Pet. Co.'s No. 1 Gething, 530 ft. each way from SE SW Sec. 14, Blk. A-9, H.&G.N. Sur. ..... Rig.
Magnolia Pet. Co.'s No. 1 Saunders, 330 ft. from SE W½ of NW, Sec. 4, Blk. 1, A.C.H.&B. Sur. ..... Drlg. 2,574 ft.
McElroy Oil Co.'s No. 2 Bruce Bull, 155 ft. from N line and 240 ft. from W line of E 87.3 acres of Sec. 3, Blk. B-2, H.&G.N.R.R. Sur. ..... Show gas 2,150 ft; drlg. 2,160 ft.
McMan O. & G. Co.'s No. 2 Binkley, 330 ft. each way from NW cor. W½ SE cor. Sec. 86, Blk. 3, I.&G. Sur. ..... Show oil 3,124 ft; setting 8-in.
Osborn et als' No. 1 E. E. Barrett, SE cor. NE, Sec. 111, Blk. 3, I.&G.N. Sur. ..... Fishing 3,275 ft.
Parton & Holt's No. 1 Gething, 330 ft each way from SE cor. NE Sec. 14, Blk. A-9 ..... Rig.
Phillips Pet. Co.'s No. 4 Johns, 330 ft. each way from NE cor. SE SW Sec. 87, Blk. 3, I.&G.N. Sur. ..... Rig.
Phillips Pet. Co.'s No. 1 Bob Olsen, NW cor. S½, Sec. 64, Blk. B-2 ..... T.D. 3,239 ft; plugged back to 3,230 ft; shot with 440 qts. at 3,119-3,222 ft; 600 ft. oil and 60 ft. wtr. in hole; drlg. 3,480 ft.

Plains Drlg. Co.'s No. 2 Saunder, 990 ft. from S line and 330 ft. from E line of E ½ SE, Sec. 4, Blk. 1, A.C.H.&B. Sur. ..... Drlg. 280 ft.
Pure Oil Co.'s No. 3 Davis, 330 ft. from NW of NE, Sec. 86, Blk. 3, I.&G.N.R.R. Sur. ..... Show oil lime 3,036 ft; drlg. 3,046 ft.

Prairie O. & G. Co.'s No. 2 Reynolds, 330 ft. each way from NW cor. SE, Sec. 61, Blk. 3, I.&G.N. Sur. ..... Bldg. rig.
Purple Sage Oil Co.'s No. 2 E. B. Johnson ..... 2,000,000 ft. gas; 200 ft. oil 3,370 ft; shot with 510 qts. 3,776-3,372 ft.; 406 ft. oil; fish. 3,875 ft.

Republic Prod. Co.'s No. 1 G. H. Saunders, 330 ft. each way from SW cor. E½ NW cor. Sec. 4, Blk. 1, A. C.H.&B. Sur. ..... Fish. 2,510 ft.
Schwald et als' No. 1 fee, 330 ft. each way from NE cor. E ½ SW, Sec. 1, Blk. 1, A.C.H.&B. Sur. ..... Drlg. 1,875 ft.
Shamrock Oil Co.'s No. 1 W. S. Clayton, 866 ft. from NW cor. of E 278.4 acres, Sec. 50, Blk. 25, H.&G.N.. Drlg. 2,275 ft.
Skelly Oil Co.'s No. 1 Saunders, 330 ft. from E line, 990 ft. from S line, SW, Sec. 4, Blk. 1, A.C.H.&B. Sur. .. Drlg. 100 ft.
Skelly Oil Co.'s No. 2 Saunders, 231 ft. from S line, 1,127 ft. from W line, SW, Sec. 4, Blk. 1, A.C.H.&B. Sur. ..... Drlg. 225 ft.
Skelly Oil Co.'s No. 3 Saunders, 330 ft. from N line and 990 ft. from W line, SW cor., Sec. 4, Blk. 1, A.C. H.&B. Sur. ..... Rig.
Skelly Oil Co.'s No. 4 Saunders, 330 ft. from N line and 990 ft. from E line, SW cor., Sec. 4, Blk. 1, A. C.H.&B. Sur. ..... Spud.
St. Clair Oil Co.'s No. 1 Rowe, Sec. 32, Blk. R ..... S.D. 1,600 ft.
St. Clair Oil Co.'s No. 1 L. S. Stockton, SE cor. Sec. 35, W. R. Lee Sur. ..... Spudded and S.D.
The Texas Co.'s No. 8 A. Chapman, T. 1,138 ft. from W and 330 ft. from S lines, SE, Sec. 51, Blk. 25, H. &G.N. Sur. ..... Cellar.
The Texas Co.'s No. 3 Davis, 990 ft. from E line and 330 ft. from N line NW, Sec. 86, Blk. 3, I.&G.N. Sur. .. 1,300 ft. oil 3,168-3,202 ft; drlg. 3,203 ft.

The Texas Co.'s No. 3 M. B. Davis, 2,309 ft. from S line and 2,312 ft. from E line, Sec. 3, Blk. 1, A.C. H.&B. Sur. ..... Drlg. 2,910 ft.
The Texas Co.'s No. 4 H. M. Davis, SE cor. NW, Sec. 86, Blk. 3, I.&G.N. Sur. ..... Fish. 2,645 ft.
The Texas Co.'s No. 5 Davis, 330 ft. S and W of NE cor. NW, Sec. 86, Blk. 3, I.&G.N. Sur. ; ..... Location.
The Texas Co.'s No. 3 McLarty and Lester-A, 330 ft. from NE W½ SW, Sec. 1, Blk. 1, A.C.H.&B. Sur. .... Spraying 10 bbls. 2,490-2,510 ft; fish. 2,560 ft.

The Texas Co.'s No. 1 Bull, 1,043 ft. from N and 330 ft. from E lines, Sec. 2, Blk. B-2, H.&G.N. Sur. ..... Drlg. 2,648 ft.
The Texas Co.'s No. 8 Saunders, 895 ft. N and 2,060 ft. E of SW cor. Sec. 3, B.&B. Sur. ..... Bldg. rig.
The Texas Co.'s No. 9 Saunders, 330 ft. S and 3,016 ft. E of NW cor. Sec. 1, Eustis Sur. ..... Rig.
The Texas Co.'s No. 7 Saunders, 990 ft. from S line and 330 ft from W line of W½ SE cor. Sec. 4, Blk. 1, A.C.H.&B. Sur. ..... Drlg. 200 ft.
Travis et als' No. 1 J. S. Morse, SE NW SW, Sec. 68, Blk. 25, H.&G.N. Sur. ..... S.D. 2,580 ft.
Ware et als' No. 1 fee, 990 ft. from N and 400 ft. from W lines, Sec. 18, Blk. 3, A.&B.M. Sur. ..... Rig.
Wilcox-Pampa Oil Co.'s No. 30 Wooley & Reynolds, NW SE NW, Sec. 61, Blk. 3 ..... Fish. for tools 2,954 ft.
Wilcox-Pampa Oil Co.'s No. 31 Worley Reynolds, 330 ft. N and E of SW cor. SE SW, Sec. 61, Blk. 3, I.&G.N.. Location.
United Eight O. & T. Co.'s No. 1 E. B. Clay, SE cor. W½ SW, Sec. 177, Blk. B-2 ..... Spraying 5 bbls. daily 3,022-40 ft; U.R. 6-in. csg.

HALL COUNTY

Rio Bravo Oil Co.'s No. 1 Hughes est., 950 ft. from N line, 150 ft. from E line, Sec. 39, Blk. H, I. A. Stephens Sur. ..... Set 6-in. 3,500 ft; S.D. 4,000 ft.

HOCKLEY COUNTY

World Oil Co.'s No. 1 Ellwood, 320 ft. from N and W lines, League 7, Wilbarger County school lands; elevation 3,363 ft; contract depth, 5,000 ft. ..... S.D. 1,455 ft.

HARTLEY COUNTY

Amarillo Oil Co.'s No. 9 Lee Bivins "A," C NW, Sec. 5, Blk 21 ..... 15,000,000 ft. gas 3,300-25 ft; T.D. 3,601 ft. to deepen.

HUTCHINSON COUNTY

R. G. Barnum et als' No. 1 Garland Sanford, Sec. 78, Blk. 4 ..... S.O. 2,920 ft; S.D. 3,020 ft.
Devonian Oil Co.'s No. 9 Johnson Bros., 330 ft. S and W of NE cor. of Lot 3, Johnson Bros. Subdivision, M. Whitley Sur. ..... Drlg. 2,420 ft.
Dunnigan et als' No. 1 C. W. Hugenbyhl, 330 ft. from S line and 330 ft. from E line, N½, Sec. 4, Blk. T. W.N.G.R.R. Sur. ..... Rig.
Oil Operators Trust Co. and Marland's No. 2 J. M. Stanford-B, Sec. 82, Blk. 46, H.&T.C. Sur. ..... S.D. 3,039 ft.
Phillips Pet. Co.'s No. 12 Elva Whittenburg, E. Tomlinson Sur. ..... S.D. 5,333 ft.
Phillips Pet. Co.'s No. 3 Johnson Bros. (Florence) 412 ft. from W and 270 ft. from N lines, Tract 2, of Geo. Montgomery Sub-div. of Mary Whitley Sur. .. 90 bbls. 2,897-2,925 ft.
Phillips Pet. Co.'s No. 19 Perkins-Martin, 990 ft. S and 330 ft. E of NW cor. of W 240 acres of S 320 acres of Sec. 1, Blk. X-03, H.&O.B. Sur. ..... Drlg. 2,060 ft.
Phillips Pet. Co.'s No. 1 Sanford-Garford, 330 ft. N and E of SW cor. N 40 acres of E 80 acres of S 160 acres of S 320 acres, Sec. 77, Blk. 46, H.&T. C.R.R. Sur. ..... Drlg. 2,190 ft.
Premier O. & G. Co.'s No. 1 L. E. Borton, C NE NW NW, Sec. 32, Blk. Y, A.&B. Sur. ..... Rigged up and S.D.
Rock Creek Oil Co.'s No. 2 Johnson, 330 ft. from N and W lines SW SE, Sec. 28, Blk. Y, A.&B. Sur. ..... S.D. 2,700 ft.
Sand Creek Oil Co.'s No. 2 J. H. Jasper, 320 ft. from S line and 387 ft. from W line of 100-acre lease, Sec. 28, Blk. M-23, T.C. Sur. ..... T.D. 3,148 ft; P.B. to 3,136 ft; shot with 220 qts. 3,036-3,136 ft; T.P. 300 bbls. fluid 50% wtr.; C.O.

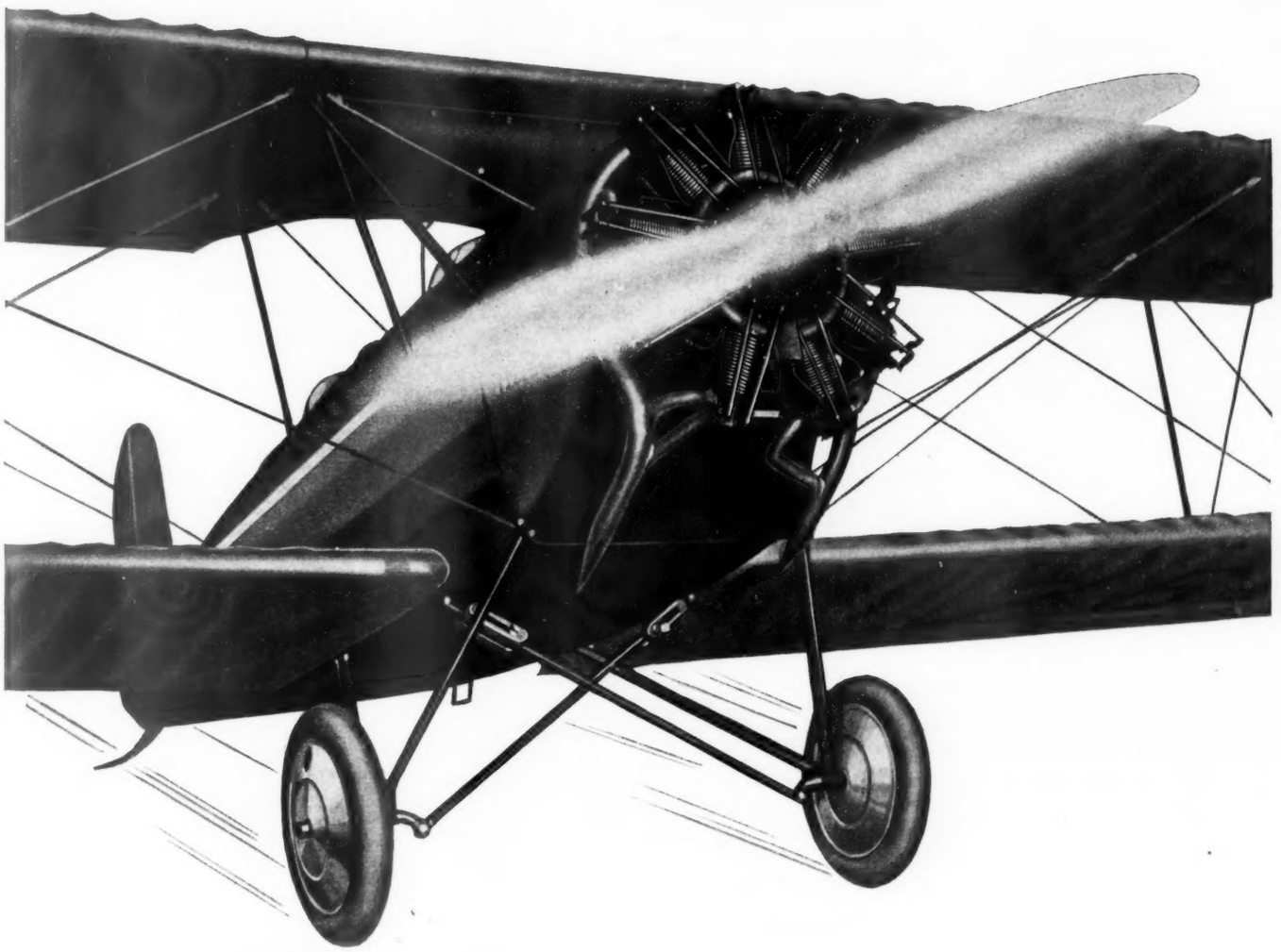
Timms et als' No. 2 Garner, 990 ft. S and 330 ft. E of NW cor. J. W. Proctor Sur. ..... Fish. 1,140 ft.
Wendell et als' No. 1 Johnson Bros., Sec. 1, Blk. X-02 .... Set 10-in. csg. 2,035 ft; S.D.
White Eagle Oil Co.'s No. 4 Johnson Bros. (Montgomery) 330 ft. from N and W lines E½, Tract 2, Geo. Montgomery Sub-div. of Mary Whitley Sur. .... Shot with 100 qts. 2,903-29 ft; C.O.

KING COUNTY

The Texas Co.'s No. 1 J. H. Johnson ..... Drlg. 4,230 ft.

LAMB COUNTY

Dan Freel et als' No. 1 Ellwood, CWL, Sec. 9, Blk. T, T. A. Thompson Sur. ..... Spudded and S.D.



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TULSA, OKLA.

LUBBOCK COUNTY

Center Oil Co.'s No. 1 Bowles ranch.....Small show oil 1,133-40 ft; sand; S.D. 3,943 ft.

MOORE COUNTY

Barnsdall Oil Corp.'s No. 1 L. R. Hagy, NW cor. Thomas Ross Sur. .....5,000,000 ft. gas 2,900-95 ft; drlg. 3,018 ft.

Canadian Gas Co.'s No. 1 Kilgore-A, 2,716 ft. S and 2, 695 ft. W of NE cor. Sec. 1, Eustis Sur. .....Cellar.

Devonian Oil Co.'s No. 1 J. T. Sneed, Jr., 2,235 ft. from E and 330 ft. from S lines, S 160 acres, N 320 acres of Matilda Robinson Sur. .....Drlg. 1,350 ft.

Dixie Creek Oil Co.'s No. 1-A Sneed, Jr., 330 ft. N and W of SE cor. E½, Sec. 65, Blk. 3, G.M. Sur. .....4,000,000 ft. gas 2,820-35 ft; drlg.

Dixie Creek Oil Co.'s No. 4-A Sneed, Jr., 330 ft. S and W of NE cor. E½, Sec. 65, Blk. 3 .....Drlg. 2,308 ft.

Fritch O. & G. Co.'s No. 1 Lee Burns, C NE 40 acres of N 160 acres, Sec. 4, Geo. Mahan Sur. .....Spudded and S.D.

McMan O. & G. Co.'s No. 1 Sneed, 2,260 ft. S and 330 ft. W of NW cor. J. W. Proctor Sur., but in Matilda Robinson Sur. .....Drlg. 2,380 ft.

Phillips Pet Co.'s No. 1 J. T. Sneed (James) 330 ft N and W of SW cor. P. Bazemore Sur. .....3,000,000 ft. gas 2,475-76 ft; drlg.

Phillips Pet. Co.'s No. 2 J. T. Sneed, 660 ft. S and 330 ft. W of NW cor. J. H. Proctor Sur. .....Drlg. 2,335 ft.

Phillips Pet. Co.'s No. 3 Sneed (James), 600 ft. S and 330 ft W of NW cor. J. W. Proctor Sur., but in Matilda Robinson Sur. .....Drlg. 1,850 ft.

Skelly Oil Co.'s No. 4 Armstrong & Byrd, 1,600 ft. S and 330 ft. E of NW cor. J. W. Proctor Sur. .....Top lime 2,317 ft; 9,500,000 ft gas 2,850 ft; lime pay 3,165-72 ft; T.D. 3,190 ft; swb. 17 bbls. in 7 hrs.

Skelly Oil Co.'s No. 5 Armstrong & Byrd, 2,260 ft. S and 330 ft. E of NW cor. J. W. Proctor Sur. .....Drlg. 1,466 ft.

MOTLEY COUNTY

Explin. Co.'s No. 1 Tillson.....S.D. 750 ft. for repairs.

Explin. Co.'s No. 2 Matador Land & Cattle Co., C SW Sec. 37, John Gibson Sur. .....Drlg. 4,405 ft.

ROBERTS COUNTY

Big Bend Oil Co.'s No. 1 Ledrick, Sec. 7, Blk. 5-A.....Formerly abd. at 5,240 ft; small show 36 grav. oil 5,288-91 ft: show oil brown sand 5,710-12 ft; drlg.

WHEELER COUNTY

Angus et als' No. 2 Morgan, C E½ NW NE, Sec. 93, Blk. 1½, H.&G.N. Sur. .....S.D. 1,050 ft.

Arnold Oil Co. et als' No. 1 Ritchey, 420 ft. from E and 460 ft. from S lines of NW cor., Sec. 5, Blk. 24, H.&G.N. Sur. .....Rig

Byrens et als' No. 1 Johnson, SW cor. NE, Sec. 88, Blk. A-5, H.&G.N. Sur .....S.D. 2,800 ft.

Canadian River Oil Co.'s No. 2 Williams-Laycock, C SW of NW, Sec. 2, Blk. 27, H.&G.N. Sur. .....Drlg. 360 ft.

Chapman & Morgan's No. 1 Otis Hatcher, NW cor SW SE, Sec. 63, Blk. 17, H.&G.N. Sur. .....S.D. 715 ft.

Lone Star Co.'s No. 1 Ackley, C NE NE, Sec. 20, Blk. 24, H.&G.N. Sur. .....Drlg. 1,842 ft.

Lone Star Co.'s No. 1 Hicks, C SW NE, Sec. 52, Blk. 17, H.&G.N. Sur. .....Rig.

Lone Star Co.'s No. 1 Shelton, C NE SE, Sec. 22, Blk. 24, H.&G.N. Sur. .....Location.

Lone Star Gas Co.'s No. 2 Stuckey, C of W ½ of SE SW, Sec. 92, Blk. 17, H.&G.N. Sur. .....Spud.

Martin & Dehon's No. 1 Gossett, C SE SE, Sec. 101, Blk. 23, H.&G.N. Sur. .....S.D. 1,625 ft.

L. W. Rock's No. 1 M. Nelson, C SW NE, Sec. 5, Blk. 24, H.&G.N. Sur. .....Fish. 1,950 ft.

L. W. Rock's No. 2 A. Smock, C SW SE, Sec. 5, Blk. 24, H.&G.N. Sur. .....Rig.

White et als' No. 1 J. M. Shelton, C SW NE, Sec 100, Blk. 1 .....Top lime 2,094 ft; S.D. 2,395 ft.

Wisch Kamper's No. 1 Parsons, C NW NW, Sec. 53, Blk. 23, H.&G.N. Sur. .....Location.

WILDCAT OPERATIONS IN OKLAHOMA

(Continued from Page 38)

OKLAHOMA COUNTY

Slick & Bailey's No. 1 Koester, C SE NE Sec. 18-13-3w..Shut down 4,510 ft.

Cromwell & Franklin's No. 1 Thompson, SW cor. NE NE Sec. 15-12-3w .....Shut down 7,001 ft.

Cromwell & Franklin's No. 1 Gross, SW cor. NE SW Sec. 22-10-2w .....Dry and abandoned 4,702 ft.

Indian Terr. Ill. Oil Co.'s No. 1 fee, C SE SE Sec. 24-11-3w .....Standardizing 6,401 ft.

OKFUSKEE COUNTY

Moose & Daniels' No. 1 Stidham, SW cor. NW Sec. 4-11-10 .....Shut down 622 ft.

Dixie Oil Co.'s No. 1 Drew, NE cor. SW Sec. 8-13-10 .Drlg. 3,016 ft.

SEQUOYAH COUNTY

Cooper & Badger's No. 1 Young, NW cor. NE NE Sec. 7-12-20 .....Shut down 440 ft.

Hunt and others' No. 1 Unknown, SE cor. NW SW Sec. 12-12-23 .....Shut down 635 ft.

PAWNEE COUNTY

Washoma Oil Co. and others' No. 1 Buffalo, SE cor. NE Sec. 33-22-5 .....Reaming casing 3,300 ft.

POTTAWATOMIE COUNTY

Phillips-Atlantic's No. 1 Winrow, SW cor. NE NE Sec. 11-9-4 .....Drlg. 3,469 ft.

Superior Oil Co.'s No. 1 Herminghausen, SW cor. NW NE Sec. 24-8-2 .....Coring 4,941 ft.; show oil.

Roxana Pet. Corp.'s No. 1 Lowe, SW cor. NW NE Sec. 17-6-5 .....Cleaning out 4,920 ft.

Pure Oil Co.'s No. 1 Lindley, SE cor. SW SE Sec. 18-8-5..Simpson sand 4,098-4,115 ft.; completed, pinched in.

T. B. Slick's No. 1 Sailor, SE cor. NW NW Sec. 12-8-3 .Rigging rotary.

T. B. Slick and Roxana Pet. Corp.'s No. 1 Hurst, SE cor. NW NW Sec. 17-7-2 .....Cementing cave 5,520 ft.

Tomlinson et al's No. 1 Whisenhurst, NW cor. NE SE Sec. 35-7-5 .....Drlg. 4,516 ft.

Phillips Petroleum Co.'s No. 1 Parman, SE cor. SW Sec. 15-8-4 .....Drlg. 4,260 ft., corrected.

Champlin Refining Co.'s No. 1 Foster, SW cor. NE SW Sec. 14-7-5 .....Drlg. 4,026 ft.

CADDO COUNTY

Magnolia Petroleum Co.'s No. 1 Shelby, SW cor. SW Sec. 28-10-12w .....Dry and abandoned 4,472 ft.

J. V. Bailey's No. 1 Hubbard, C NE NW Sec. 1-10-6w . Shut down 150 ft.

W. J. Hartley's No. 1 Galbreath, SE cor. NW SE Sec. 29-5-12w .....Shut down 3,394 ft.

English Drilling Co.'s No. 2 Pruitt, CNL NW SE Sec. 22-6-10w .....Rigged up and shut down.

Red Bank Oil Co.'s No. 1 Shanklin, C NW Sec. 15-12-11w. Drlg. 4,540 ft.

OSAGE COUNTY

Amerada Pet. Corp.'s No. 1, NE cor. SW Sec. 25-25-6 ..Dry and abandoned 2,925 ft.

White Eagle Oil & Ref. Co.'s No. 1, SE cor. NE Sec. 25-26-6 .....Drlg. 540 ft.

STEPHENS COUNTY

Wade-Martin & Smythe's No. 1 Vestal, NE cor. SE Sec. 20-2-5w .....Dry and abandoned 2,510 ft.

Stahl & Burris' No. 1 Jefferson, SE cor. NE NW Sec. 2-1-7w .....Drlg. 1,529 ft.

SEMINOLE COUNTY

Prairie Oil & Gas Co.'s No. 1 Davis, NE SE Sec. 21-10-7 Fishing 3,350 ft.

Superior and Fuhrman's No. 1 Fay, NW cor. SE SW Sec. 27-11-6 .....Drlg. 4,470 ft.

Magnolia Pet. Co.'s No. 1 Germany, SE cor. NW Sec. 30-9-5 .....Lowering casing 4,159 ft.

Phillips Pet. Co.'s No. 1 Miller, NW cor. SW Sec. 34-11-7 .....Drlg. 2,860 ft.

Burke-Greis Oil Co.'s No. 1 Cyrus, SE cor. NE NW Sec. 13-9-7 .....Underreaming 2,165 ft.

Harris and others' No. 1 Stidham, SE cor. NW Sec. 30-9-8 .....Casing 3,822 ft.

T. B. Slick's No. 1 Wood, NE cor. NE SW Sec. 26-7-6 Cromwell sand 3,314-20 ft., flowing 1,000 bbls.

C. B. Shaffer's No. 1 Carolina, SE cor. SW NE Sec. 4-6-7. Drlg. 4,725 ft.

E. W. Whitney's No. 1 Harjo, NE cor. NW NE Sec. 25-7-6 .....Plugged back 4,325 ft., and shut down.

Gypsy Oil Co.'s No. 1 Andrews, NE SE NW Sec. 27-10-7 .....Drlg. 3,862 ft.

Shaffer Oil & Ref. Co.'s No. 1 Catchoches, SW cor. SW NE Sec. 18-10-7 .....Straightening hole 3,730 ft.

Prairie Oil & Gas Co.'s No. 1 Rogers, SE cor. NE SE Sec. 14-10-6 .....Dry and abandoned 4,729 ft.

T. W. Adkins' No. 1 Reed, NE cor. NW Sec. 2-8-8 .....Drlg. 900 ft.

T. B. Slick, Inc.'s, No. 1 Tiger, NW cor. SW NE, Sec. 13-8-5 .....Hole full water 4,416 ft.

Magnolia Petroleum Co.'s No. 1 Sissy, SW cor. NE Sec. 33-8-7 .....Drlg. 4,016 ft.

McCulloch Oil Co.'s No. 1 McGilbray, SW cor. SW NE Sec. 4-8-8 .....Drlg. 1,070 ft.

Empire Gas & Fuel Co.'s No. 1 Harjo, SW cor. NW SE Sec. 17-7-6 .....Hole full water, Wilcox 4,593-4,600 ft.

Marland Oil Co.'s No. 1 Strothers, NW cor. SE NE Sec. 5-10-7 .....Rigging up.

Magnolia Pet. Co.'s No. 1 Carroll, SW cor. NW SE Sec. 1-7-5 .....Location.

MAJOR COUNTY

Randau & Mooney's No. 1 Parker, SE cor. NE NW Sec. 4-23-16w .....Show of oil 1,235 ft.; shut down.

WOODS COUNTY

E. K. Miller's No. 1 Copenhavers, NW cor. NW Sec. 18-24-13w .....Rig.

MURRAY COUNTY

Bison Oil Co.'s No. 1 Labor, NW cor. NW Sec. 17-1-2....Drlg. 1,510 ft.

DEWEY COUNTY

Huckaby & McCoy's No. 1 Perfect, NE cor. NE Sec. 9-18-15w .....Fishing 4,345 ft.

Don Sifers' No. 1 Jordan, SW cor. NW Sec. 16-16-17w...Spudded and shut down.

BECKHAM COUNTY

C. & H. Petroleum Co.'s No. 1 Barnes, SW cor. NW NE Sec. 32-9-22w .....Shut down 3,460 ft.

Martin and others' No. 1 Cluck, NW cor. SE Sec. 1-8-25w. Drlg. 1,590 ft.

L. C. Hivicks' No. 1 Davis, C NW NE Sec. 4-11-26w.....Shut down 725 ft.

Producers Exploration Co.'s No. 1 Seidell, SE cor. SW SW Sec. 17-9-22w .....Drlg. 2,575 ft.

Carson and others' No. 1 Danby, SW cor. SE NE Sec. 20-8-22w .....Location.

Pferffel and others' No. 1-A Carter, NE cor. NE Sec. 35-9-22w .....Shut down 1,500 ft.

Day Oil Co.'s No. 1 Ault, NW cor. NW Sec. 33-8-21w....Drlg. 520 ft.

GRADY COUNTY

Remington and others' No. 1 Fryrear, SW SW NE Sec. 13-9-5w .....Shut down 720 ft.

J. V. Bailey's No. 1 Hubbard, C NE NW Sec. 1-10-6w...Spudded and shut down.

J. M. Henry and others' No. 1 Abrham, SE cor. NW Sec. 4-8-8w .....Rig.

Commerce Development Co.'s No. 1 Taylor, C NE NW Sec. 4-8-7w .....Testing sand 2,410-21 ft.

J. B. Nichols' No. 1 Brake, SE cor. NE SE Sec. 7-5-7w. Shut down 2,307 ft.

McINTOSH COUNTY

Marlone Oil Co.'s No. 1 Sanders, NW cor. NE SW Sec. 10-9-18 .....Shut down 2,387 ft., corrected.

Patterson and others' No. 1 Smith, SW cor. NW SE Sec. 32-9-16 .....Shut down 5,451 ft.

Wolfe and others' No. 1 Unknown, NW cor. SE Sec. 15-12-18 .....Rig on ground.

CLEVELAND COUNTY

Daniels & LeWright's No. 1 Vandever, C SW Sec. 15--1w .....Shut down 3,130 ft.

KIOWA COUNTY

Blue Mountain Oil Co.'s No. 1 Jones, SE cor. NW NW Sec. 17-5-14w .....Shut down 530 ft.

Sloan-Russell's No. 1 Rushton, NE cor. SW SE Sec. 6-5-14w .....Drlg. 400 ft.

J. M. Burke's No. 1 Fox, SW cor. NW Sec. 4-6-16w.....Drlg. 920 ft.

Johnson & McDowell's No. 1 Thompson, SW cor. NE Sec. 6-6-15w .....Drlg. 1,920 ft.

Dave Malernee's No. 1 Van Kirk, NW cor. NW Sec. 35-7-15w .....Shut down 858 ft. in granite.

A. C. Varner and others' No. 1 Bonham, CSL NW NW Sec. 5-6-18w .....Shut down 1,127 ft.

CUSTER COUNTY

W. E. Witts' No. 1 Wellman, C SE Sec. 1-14-14w .....Rig and tools.

PONTOTOC COUNTY

Moore & Curran's No. 1 Allen, SE cor. SW SW Sec. 23-5-5 .....Shut down 1,460 ft.

Roxana Pet. Corp.'s No. 1 Folsom, NW cor. SW Sec. 20-4-4 .....Drlg. 905 ft.

Boles and others' No. 1 Rayburn, SW SE Sec. 35-4-6....Lost underreamer; abandoned at 1,340 ft.

Texas Pacific Coal & Oil Co.'s No. 1 Stewart, C SW NE Sec. 11-5-8 .....Preparing to test Wilcox 3,435 ft.

American Oil Refining Co.'s No. 1 Jones, NE cor. NE Sec. 18-5-5 .....Drlg. 1,905 ft.

GARVIN COUNTY

R. F. Garland's No. 1 Strickland, SW NW SW Sec. 10-4-3 .....Drlg. 3,264 ft.

COMANCHE COUNTY

Green and others' No. 1 Wilson, C NE SW Sec. 14-1-12w. Drlg. 4,016 ft.

Wirt Franklin Pet. Co.'s No. 2 Holler, NW cor. NW Sec. 2-4-11w .....Drlg. 1,425 ft.

COAL COUNTY

McGraw and others' No. 1 Patton, SW SE NE Sec. 35-1-8 .....Wilcox 4,770-93 ft., dry, plugging back to show oil 1,790 ft.

Indian Territory Illuminating Oil Co.'s No. 1 Harris, SW cor. NW Sec. 10-1-11 .....Drlg. 4,660 ft.

Robert Galbreath and others' No. 1 Jones, SW cor. SE Sec. 24-1-9 .....Shut down 1,595 ft.

PITTSBURG COUNTY

McAylor and others' No. 1 Reed, NW cor. SW NW Sec. 7-6-14 .....Drlg. 1,320 ft.

JACKSON COUNTY

Atlus Oil Co.'s No. 1 Northington, NE cor. NE Sec. 4-1-20w .....Shut down 735 ft.

SOUTHERN OKLAHOMA

BRYAN COUNTY

Alexander & Oppenheimer's No. 1 Hampton, SE cor. NE Sec. 26-7s-11 .....Shut down 1,425 ft.

MURRAY COUNTY

Alter and others' No. 1 Johnson, SW cor. NW Sec. 14-4-7. Spudded and shut down.

COTTON COUNTY

Cuyler & Pyson's No. 1 Thomas, SE cor. SE SW Sec. 16-4-12w .....Drlg. 1,685 ft.

G. E. Crane and others' No. 1 Montgomery, C NW NE Sec. 33-2s-9w .....Shut down 3,510 ft.

JEFFERSON COUNTY

Fritz and others' No. 1 Barrett, C SE SE Sec. 5-4S-7w...Drlg. 1,736 ft.

Amerada Petroleum Corp.'s No. 1 Emerson, NW cor. SE SW Sec. 28-5s-8w .....Shut down 4,516 ft.

CHOCTAW COUNTY

Choctaw Petroleum Co.'s No. 1 Wilson, SW cor. SW Sec. 15-6-19 .....Shut down 1,346 ft.

TILMAN COUNTY

Bray and others' No. 1 Barker, NE cor. SW NW Sec. 9-1-15w .....Shut down 805 ft.

Dixie Oil Co.'s No. 1 McKinney, NE cor. NE Sec. 29-3s-18w .....Location.

A. N. Pearson's No. 1 Mounts, SW cor. SW Sec. 3-5s-15w. Corrected; drlg. 1,845 ft.

Stanley & McGregor's No. 1 Mock, NW cor. NW SW Sec. 33-1-20w .....Shut down 1,641 ft.

Landfair and others' No. 1 Smith, SE SW SE Sec. 6-2s-15w .....Shut down 2,485 ft.

JOHNSTON COUNTY

Wapanucka Oil Co.'s No. 1 Banks, Sec. 28-2s-9 .....Shut down 1,790 ft.

Bush Creek Oil Co.'s No. 1 Kirby, SE cor. NE NW Sec. 9-4-7 .....Shut down for casing 405 ft.

Smith & Kinsley's No. 1 Lane, SE cor. NW Sec. 29-1-7. Drlg. 1,080 ft.

Yale Oil Syndicate's No. 1 Craige, C NW NE Sec. 36-3s-8e .....Location.

Sullivan and others' No. 1 Wines, NW NE NW Sec. 11-7s-5e .....Drlg. 375 ft.

E. J. Stump and others' No. 1 McGinnis, SW Sec. 26-3s-8w .....Rig.

McCraw and others' No. 1 Trust, SW Sec. 12-1s-8e.....Rig.

TEXAS GROSS PRODUCTION DECLINES DURING THE THIRD QUARTER OF 1928

Reports filed with the state comptroller of Texas for taxation purposes show gross crude oil production in Texas during the third quarter of this year totaled 44,550,350.60 bbls. with a value of $42,564,610.31 as compared to a production of 61,130,606.26 bbls. and a value of $56,129,920.75 for the second quarter. The reports, as filed with the state comptroller, follow:

Name and address—	Barrels	Value
A		
Apple-Brandeberry Oil Co., Wichita Falls	12,366.14	$18,271.12
Alaska Petroleum Co., The, Amarillo	1,496.21	1,644.92
American Refining Properties (W. M. Priddy), Wichita Falls	9,986.89	13,682.02
Ascot Co., The, Wichita Falls	6,967.76	10,991.99
Ailes, J. W., Wichita Falls	639.47	876.07
Aarco Oil & Gas Co., Baltimore, Md.	9,474.67	14,345.98
Artex Oil Corp., Wichita Falls	2,276.02	3,354.46
Arnold & Frazier, Putnam	474.00	723.70
Amarillo Oil Co., Amarillo	2,257.22	1,918.64
Adams, R. W., trustee No. 2, Amarillo	4,903.49	7,237.99
Appleman, H., Tulsa, Okla.	14.50	16.10
Adams, W. R., Wichita Falls	506.50	724.18
Aronson, M., Brenham	3,186.12	2,397.96
Atkinson & Sandefer Oil Corp., Breckenridge	21,100.84	30,374.10
Arco Oil Co., Wichita Falls	29,360.43	27,302.28
Abercrombie, J. S., Co., Houston	62,576.09	75,105.67
Anchor Oil Co., Dallas	1,029.35	1,420.58
Alonso, Jr., Oil Producers, Laredo	1,058.46	1,058.46
American Refining Properties (N. B. Chenault), Wichita Falls	1,517.23	2,255.34
Andrews, W. R., et al, Putnam	1,461.62	1,993.95
Antelope Creek Oil & Gas Co., Amarillo	19,313.99	17,575.73
A. & P. Production Co., Houston	31,986.09	38,665.98
Atlantic Oil Producing Co., Dallas	2,541,768.77	1,695,571.97
Ashe Syndicate, The, Fort Worth	667.05	931.40
American Refining Properties, Wichita Falls	58,349.82	60,794.13
Amerada Petroleum Corp., Tulsa, Okla.	203,365.39	230,550.74
Atlas Oil Corp., Humble	2,921.00	3,505.00
American Well & Prospecting Co., Corsicana	30,063.10	30,063.10
Abbott, R. W., Beaumont	2,399.89	2,879.87
Alamosa Oil Co., Amarillo	58,508.17	52,138.52
Atlas Production Co., Burkburnett	1,492.50	2,018.76
Ada Belle Oil Co., Batson	25,180.61	30,351.21
American Refining Properties (M. J. Bashara estate), Wichita Falls	3,496.06	5,164.65
American Refining Properties (R. M. Waggoner estate), Wichita Falls	2,114.47	3,209.97
Allday Oil Corp., Wichita Falls	9,770.75	14,196.39
Arkansas Fuel Oil Co., Shreveport, La.	6,822.00	9,423.38
Alamo Oil Co., Brownwood	506.00	657.80
Alcorn Oil Co., Beaumont	7,397.58	8,877.09
Amicable Life Insurance Co., Waco	192.00	268.80
Ancell, George B., Sr., Electra	2,062.17	2,598.34
Andrews Petroleum Corp., New York, N. Y.	4,891.34	5,718.79
Abraham, Earl, Bridgetown	955.60	1,495.47
All-American Oil & Gas Co., Oklahoma City, Okla.	41.49	57.08
B		
Bennett, Mills, Production Co., Houston	28,133.06	32,687.50
Baker, James Blair, et al, Wichita Falls	28,071.79	38,177.63
Brownwood Producing & Refining Co., Brownwood	1,728.11	2,272.63
Badger Oil Co., The, Amarillo	8,631.16	10,381.62
Brady Brothers, Minerva	1,735.50	2,383.20
Brannon & Murray, Cisco	4,686.16	7,295.00
Burris, Joe D., et al, Cross Plains	4,409.94	5,526.71
Bolivian Petroleum Corp. (Atlantic Keystone Petroleum Corp)., Fort Worth	2,133.48	2,133.48
Britton, Gordon & Wickens, Strawn	684.34	1,031.33
Bridwell & Mayfield, Wichita Falls	9,080.94	14,270.80
Black Cat Oil Co., Electra	1,085.47	1,550.74
Bartlett Production Co., Rockdale	1,630.57	2,233.87
Black, W. A., Albany	1,006.81	1,197.31
Brown, C. W., Coleman	2,842.09	4,624.14
Bailey, Fannie, Wichita Falls	1,126.27	1,585.89
Burkburnett Production Oil Trust, Baltimore, Md.	848.12	1,247.05
Bruce, H. J., Wichita Falls	1,684.98	2,628.56
Burke-Greis, Oil Co. and Gwinnup, et al, Tulsa, Okla.	4,082.94	3,996.22
Burke-Greis Oil Co., Tulsa, Okla.	2,224.73	2,853.03
Barkley & Meadows, et al (Waggoner D lease), Wichita Falls	24,206.12	32,856.48
Barkley & Meadows, et al (Waggoner C lease), Wichita Falls	45,402.26	61,144.00
Barkley & Meadows, Wichita Falls	95,387.52	135,014.76
Biggs Oil & Gas Co., McKinney	1,147.00	1,801.48
Buttram Petroleum Corp., Oklahoma City, Okla.	48,700.50	75,474.63
Bonchil Co., The, Wichita Falls	6,718.22	10,193.05
Big Indian Oil & Development Co., The, Gainesville	744.34	1,042.08
Broughton, S. J., Brownwood	38.86	49.74
Baldwin, F. C., et al, Fort Worth	1,522.32	2,353.91
Blair & Keil, Dallas	1,056.56	1,278.45
Bradstreet, The L. G. Co., Fort Worth	27,669.33	43,630.19
Bailey, Carl B., Wichita Falls	6,269.56	9,365.51
Bridwell & Heydrick, trustee, Wichita Falls	2,836.84	4,353.04
Booth Oil Co., Olney	104.00	150.91
Baird Oil Co., Putnam	256.00	326.70
Black Diamond Oil Co., Amarillo	568.22	514.40
Babcock, Scheurer & Schlaffke, Electra	133.51	196.84
Bevering, A. H., et al, Henrietta	2,200.40	3,026.59
Burton McKee Oil Corp., Strawn	402.35	537.61
Big Lake Oil Co., Pittsburgh, Pa.	1,284,335.99	1,530,121.30
Bonner, J. H. S., et al, Wichita Falls	5,707.64	8,289.02
Burns, L. T., Wichita Falls	63,443.56	96,850.59
Bexar Oil Co., San Antonio	1,585.16	1,775.72
Brazos River Gas Co., Wichita Falls	2,304.94	3,692.84
Beaver Oil Corp., Oklahoma City, Okla.	9,160.51	9,502.07
Brown, Dr. E. W., estate, Orange	1,599.61	1,919.52
Bashara, M. J., & Sons, Wichita Falls	16,793.59	20,294.59
Bashara, M. J., & Co., Wichita Falls	3,619.24	4,166.72
Bashara & Bashara, Waco	230.00	244.65
Big State Oil Corp., Dallas	645.08	816.27
Brooks & Hanlon, Inc., Tulsa, Okla.	881.46	1,146.22
Bohner, C. J., Burkburnett	7,398.69	11,156.60
Biel, William A., Von Ormy	32.00	36.40
Bynum & Palmer, Rockdale	159.96	229.75
Barnsdall Oil Co., Tulsa, Okla.	43,652.81	56,109.47
Brown, Mrs. Carrie L., et al, Orange	21,703.89	26,044.65
Bridwell Oil Co., Wichita Falls	23,652.19	30,571.37
Bourbon Royalty Co., Dallas	15,449.28	17,040.10
Borealis Oil Co., Oklahoma City, Okla.	4,308.22	6,453.86
Barnes, J. B., Electra	4,152.06	5,475.15
Brinkley Producing & Refining Co., Pittsburgh, Pa.	543.66	705.08
Barbara Oil Co., Oklahoma City, Okla.	4,618.02	7,224.88
Bartlett, William, Co., Electra	519.64	836.62
Barkley & Crotty, Ranger	5,212.89	7,407.12
Barkley & Conway, Ranger	4,507.03	7,349.70
Barkley, Gholson, et al, Ranger	4,956.83	6,633.67
Barkley, Gholson, et al, Ranger (March 31, 1928)	598.50	886.44
Barkley, Gholson, et al, Ranger	67.98	116.24
Barkley, Gholson, et al, Ranger (June 30, 1928)	213.93	321.09
British, The American Oil Pro. Co., Wichita Falls	10,026.52	14,822.85
Bashara, J. F., Houston	8,146.79	9,776.14
Bowman Oil Co., Rockdale	1,208.20	1,655.84
Bynum, W. W., Rockdale	1,240.62	1,716.99
Braden, Co., The, Eastland	2,627.64	4,047.82
Boller, C. W., Wichita Falls	6,701.35	10,157.22
Bullington, Lee, Pendleton & Bullington, Wichita Falls	19,785.05	29,083.95
Breeding & Hutson, et al, Rising Star	2,167.03	3,465.44
Bass & Dillard, Wichita Falls	30,301.80	41,405.50
Blue Bonnet Petroleum Corp., San Antonio	1,070.71	1,209.12
Baker, J. A. and Mollie B., Breckenridge	8,570.00	12,083.70
Brownlee-Fope Oil Co., Austin	3,792.04	4,572.12
Big 4 Consolidated Oil Co., El Paso	52.65	68.89
Burk Burnett, Jr., Oil Co., Fort Worth (March 31, 1928)	361.24	415.99
Broughton, S. J., Brownwood	61.00	77.30
Burk Burnett, Jr., Oil Co., Fort Worth (June 30, 1928)	271.66	314.96
Byrd & Golston, Brownwood (June 30, 1928)	2,974.01	4,288.57
Bourbon Royalty Co., Dallas (7-1-27 to 10-1-28)	772.45	852.00
Beams, Drew, Okmulgee, Okla.	1,272.40	1,912.79
Birk, C. E., and C. L. Kelly, Iowa Park	200.48	277.54
Bleack-Pearson-Hudson, Corsicana	3,751.57	3,751.57

THE TRENCH JOB

The "TOLEDO" No. 2 threading device, capacity 2½" to 4" pipe inclusive, illustrated below, is above shown threading 4" pipe down in the trench and doing the job easily.

No matter where the pipe may be, you will find that a "TOLEDO" Tool will cut or thread it easily, quickly and most efficiently. "TOLEDOS" are made in all sizes up to and including 12" and they are the ideal tools for any job.

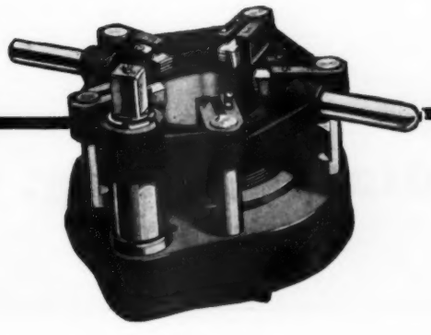
"TOLEDO"

If you are not already a "TOLEDO" user, just specify a genuine "TOLEDO" trademarked tool when next placing your order with your jobber, and you will appreciate the superior features of this tool.

A copy of the complete "TOLEDO" catalog will be gladly sent you on request.

THE TOLEDO PIPE THREADING MACHINE CO., Toledo, Ohio

New York Office, 72 Lafayette St.



Unnecessary-Eliminate It!

Per Cent of Fires Due to Each Cause.

Cause—	Per cent
Failure of auto shut-off valve	20
Loose connections and leaky piping	**15**
Defective oil burner	11
Back fires	12
Carbonization	7
Absence of or extinguishment of pilot light	6
Miscellaneous	6
Careless operation	4
Absence of auto shut-off valve	4
Imperfect combustion	4
Unknown	3
Dirty flues	3
Electric short circuit	3
Overheated furnaces and flues	2

—OIL & GAS JOURNAL
Aug. 2, 1928

McKIM METALLIC—ASBESTOS GASKETS Make Tight, Leak Proof Joints

McCord Radiator & Mfg. Co.
DETROIT

Name and address—	Barrels	Value
Barkley, Crotty Six and Little, Ranger	1,241.16	1,631.12
Breckenridge Gasoline Co., Toledo, Ohio	44.26	53.56
C		
Cranfill & Reynolds, Cisco	582,116.40	432,660.45
Cromwell, Carl G., Best	10,301.70	6,616.79
Crabb & McNeel, San Angelo	2,178.60	3,090.89
Crown Oil Corp., Brownwood	2,875.85	3,654.80
Cole Petroleum Co., Laredo	57,961.82	57,961.82
Consolidated Oil Co. of Texas, Wichita Falls	102,258.43	140,166.77
Cottom, J. H. & Co., Wichita Falls	1,385.69	2,051.47
Central Holding Co., Wichita Falls	393.29	587.96
Chapman, P. A., Jr., Eastland	673.78	952.07
Conner, Son & Cloughley, Gotebo, Okla.	14,868.73	22,114.68
Cohen, Aaron, Baltimore, Md.	7,699.06	12,082.36
Cook, R. H., Electra	255.00	384.78
Clark, C. W., Wichita Falls	128.42	181.07
Carlin and Tobin, Ranger	297.00	479.12
Carlin, W. W., Ranger	279.00	398.04
Crenshaw, Albert, Wichita Falls	4,368.22	6,191.83
Central Oil Co., Cameron	1,517.76	2,023.69
Cranfill Brothers Oil Co., Wichita Falls	7,718.62	11,584.13
Cunningham & Bratcher, Loving	8,618.38	10,459.38
Collier, J. W., et ux Mrs. Mabel, Tipton, Okla.	447.05	557.30
Cornhusker Oil Co., Lincoln, Neb.	2,362.11	2,952.11
Clear Lake Oil Co., Rockdale	1,658.29	2,278.08
Col Tex Oil Co., Spokane, Wash.	388.44	411.74
Coffey & Schlaffke, Electra	82.68	128.98
Coppock & Coleman, Iowa Park	18,167.00	27,972.73
Cawling & Newell Oil Co., Burkburnett	262.76	375.72
Cawling & Happes, Burkburnett	176.04	259.53
Cisco Oil Co., Tulsa, Okla.	33,392.27	42,534.66
Cranfill Brothers Oil Co., Dallas	188,544.35	72,874.05
Cosden & Co., Inc., Fort Worth	122,397.57	160,916.08
Charter Oil Co., The, Brownwood	60,791.82	94,942.74
Central Texas Refining Co., Brownwood	7,721.06	11,642.11
Coffey & Graham, Wichita Falls	243.84	380.38
Christie Brothers, Wichita Falls	6,386.08	9,017.73
Curtis, James A., Wichita Falls	1,812.42	2,751.87
Crosscut Corp., The, Fort Worth	1,188.88	1,645.42
Capitol Oil Co., Orange	2,245.54	2,694.65
Conway Brothers, Ranger	2,974.90	4,523.02
Conway Brothers & Gholson, Ranger	231.28	324.17
Chestnut & Smith Corp., Tulsa, Okla.	11,531.36	16,381.76
Cosa Oil Co., Cisco	289.54	464.41
Caruthers Co., San Antonio	2,153.59	2,249.32
Continental Oil Co., Wichita Falls	566,223.15	674,748.02
Cunningham, E. J., et al, Coleman	32,576.95	36,709.56
Cox, Edwin B., Ardmore, Okla.	2,444.92	3,250.89
Castlebury, S. A., Vernon	420.16	570.76
Chenault, W. L., Amarillo	604.14	917.23
Cockrell-McIlroy Oil Co., Inc., Amarillo	28,591.95	24,111.32
Chapman, E. L., trustee, Fort Worth	1,688.66	2,525.07
Center Field Oil Co., Amarillo	419.92	319.14
Culbertson Brothers Co., Fort Worth	1,228.33	1,903.91
Campbell & Wills, Burkburnett	1,530.10	2,228.38
Cunningham, Bratcher & Pennell, Loving	21,398.58	27,586.04
Clark, R. R., Wichita Falls	17,504.09	26,513.22
Coyle-Concord Oil Co., San Antonio	11,248.61	9,900.27
Columbia Petroleum Co., Mirando City-Laredo	11,639.00	11,639.00
Corpus Christi Oil Co., The, Corpus Christi (6-3-28)	405.45	405.45
Corpus Christi Oil Co., Corpus Christi	374.95	374.95
Canary, S. C., et al, Tulsa, Okla.	754.72	1,103.84
California Co., The, Colorado	1,426,135.00	968,245.18
Cashdollar & Snyder, Brownwood	254.08	307.42
Clara Oil Co., Wichita Falls	633.28	896.66
Canyon Oil & Gas Co., Inc., The, Cross Plains	2,077.70	3,225.73
Cullen, West & Pillot, Houston	203,853.33	269,661.36
Cullen, H. R., et al, Houston	21,853.76	26,092.90
Cole, W. C., Wichita Falls	2,143.31	3,161.11
Caudle, Fifer, Rockdale	350.00	525.00
Camp Oil & Gas Co., The, Wichita Falls	1,122.475	1,626.39
Collins, J. L., & Co., Corsicana	5,124.53	5,372.34
Church-Weekley & Fields, Fort Worth	34,209.67	21,898.80
Crown Oil & Refining Co., Houston	12,222.54	14,667.04
Crown Central Petroleum Corp., Houston	56,685.81	56,685.81
Craig & Lowrie, Pittsburgh, Pa.	2,301.49	2,575.89
Carey, E. S., et al, Wichita Falls	251.96	302.35
Carey, E. S., et al, Wichita Falls	651.96	847.55
Carter, Roy L., Wichita Falls	26,366.43	17,368.59
Clem Oil Co., Houston	455.64	455.64
Clarkson, William, Jr., Corsicana	1,923.66	2,730.91
Curry, E. M., Rising Star	1,432.54	2,271.37
Cobie-Whittenburg Oil Co., Amarillo	3,633.29	3,576.66
Chapman, O. H., Waxahachie	205.06	246.29
Clay, J. D., Houston	1,777.06	2,043.62
Cezeaux & Martin, Humble (6-30-28)	5,304.85	6,377.73
Cushing Refining & Gasoline Co., Cushing, Okla.	5,678.04	10,637.84
Cluney, W. J., et al, Breckenridge (6-30-28 to 7-31-28)	623.78	638.44
Crome & Crome, Iowa Park, Route 2	141.40	203.78
Currie Oil Corp., Washington, D. C. (6-30-28)	327.63	480.88
Caudle, Fifer, Rockdale (6-30-28)	350.00	525.00
Chestnut-Smith Corp., Tulsa, Okla. (6-30-28)	3,200.00	4,183.81
Cunningham, E. J., et al, (Jennings, A, B and C leases) Coleman (6-30-28)	17,824.02	20,430.01
Clark & Wilson, Wichita Falls	656.69	788.07
Central Holding Co.-Jennings, Wichita Falls	512.48	712.47
Continental Supply Co., The, St. Louis, Mo.	508.38	673.61
Cunningham Production Co., El Paso	15,470.29	17,957.47
Coffield & Hale, Rockdale	2,725.71	3,779.61
Cosden, J. S., Inc., Fort Worth	6,426.99	9,055.63
Champlin Refining Co. and J. T. Parks, Enid, Okla.	38,531.50	27,480.69
Cardinal Oil Co., Eastland (7-1-26 to 7-30-28)	32,330.85	63,501.20
Chapman, P. A., estate, Waxachachie	14,570.50	19,620.84
Camel Oil Co., Pampa	2,638.95	3,090.57
Caldwell, John W., Wichita Falls	1,611.60	2,399.21
D		
Dean Oil Co., Burkburnett	574.07	706.10
Danciger Oil & Refining Co. of Texas, Fort Worth	109,496.62	136,695.56
Dunaway, J. E., et al, Wichita Falls	2,676.42	3,745.15
Duquesne Oil Corp., Eastland	257.29	411.78
Davis, Caroline A., Somerset	375.15	393.90
Dibble Oil Co., San Antonio	977.00	977.00
Dorian, R. P., Wichita Falls	8,551.53	11,510.35
Dunbar, S. M., No. 1, Houston	492.53	566.41
Duho Oil Co., Houston	353.45	450.54
Dalton, Jack, Oil Co., Fort Worth	1,934.00	2,807.03
Derby, Haines & Williams, Wichita, Kans.	8,946.56	6,809.56
Derby Oil Co., The, Wichita, Kans.	23,119.36	26,110.87
Derby, A. L., and E. A. Haines, Wichita, Kans.	15,036.82	14,783.21
Diana Oil Co., Tulsa, Okla.	1,010.57	1,424.90
Delmar Oil Co., Bartlesville, Okla.	1,521.23	1,674.69
Dillon Glasscock Co., San Antonio	628.92	630.84
Duetser, B., trustee, Beaumont	1,077.91	1,293.49
Devonian Oil Co., Tulsa, Okla.	32,117.00	33,329.49
Duncan, J. W., Wichita Falls	1,856.00	2,728.32
Douglas Brothers Oil Co., Electra	2,412.94	3,659.08
Davis, L. R., Tulsa, Okla.	182.23	194.95
Dixon Reeder & Cook, Wichita Falls	949.11	1,408.43
Developers Oil & Gas Co., Wichita Falls	1,165.00	1,723.83
Dale-Knotts Oil Co., Wichita Falls	345.18	529.14
Dudley, G. S., Iowa Park	1,387.77	2,188.71
Dixie Oil Co., Inc., Shreveport, La.	125,185.59	79,783.71
Dixie Drilling Co., Fort Worth	334.32	446.28
Dennis, J. S., Moran	1,192.63	2,311.21
Duke-Langford Oil Co., Wichita Falls	3,284.03	3,284.03
Dominion Oil Co., Tulsa, Okla.	1,459.97	2,011.97
Dickson, J. H., Tulsa, Okla.	257.36	358.52
Dale & Crawford, Electra	775.92	1,172.78
Dixon Creek Oil Co., Inc., Amarillo	130,038.46	111,990.91
Davis, W. F., Wichita Falls	890.02	1,269.13
Dayton Oil Co., Dayton	481.80	578.16
Douglas Oil Co., Tulsa, Okla.	1,489.12	1,415.39
Dale Oil Corp., Wichita Falls	27,740.68	42,076.84
Dale Oil & Refining Co., The, Wichita Falls	614.94	880.04
Davis & Coggin Oil Co., Wichita Falls	17,346.42	26,019.62
Davis, J. C., Wichita Falls	3,770.60	5,655.90
Duffield & Howard Oil Co., Tulsa, Okla.	929.56	1,119.76
Dunnigan & Wylie, Albany	274.22	350.84
Davis & Wallace, Cameron	1,690.40	2,180.61
Dalton Bell Oil Co., Mineral Wells	578.00	842.88
Deep Sand Syndicate, Corsicana	None	None
Den-Wich Oil Co., Abilene (6-30-28)	1,569.99	2,111.62
Den-Wich Oil Co., Abilene	1,661.90	2,334.56
Dallas Petroleum Co., Dallas	586.98	918.49

Parkersburg

HAS SERVED THE OIL FIELDS OF THE WORLD FOR THIRTY-ONE YEARS

Drilling Machines

PARKERSBURG PORTABLE DRILLING MACHINES
PARKERSBURG All Steel DRILLING MACHINE
PARKERSBURG Combination DRILLING MACHINE

PARKERSBURG Portable Drilling Machines are the result of years of specialized effort. The many outstanding and exclusive features embodied in their design and construction originated through a combination of engineering skill and definite knowledge of oil field requirements.

Efficient, economical, easily portable, and still possessed of the stability of a Standard Rig, these machines are rendering an exceptional service in many fields throughout the world.

Detailed specifications on Parkersburg Wooden Drilling Machines, All-Steel Drilling Machines and the new combination Wood and Steel Drilling Machines are available in catalog form, and will be sent upon request. These machines may be secured in either *Chain* or *Bull Rope*.

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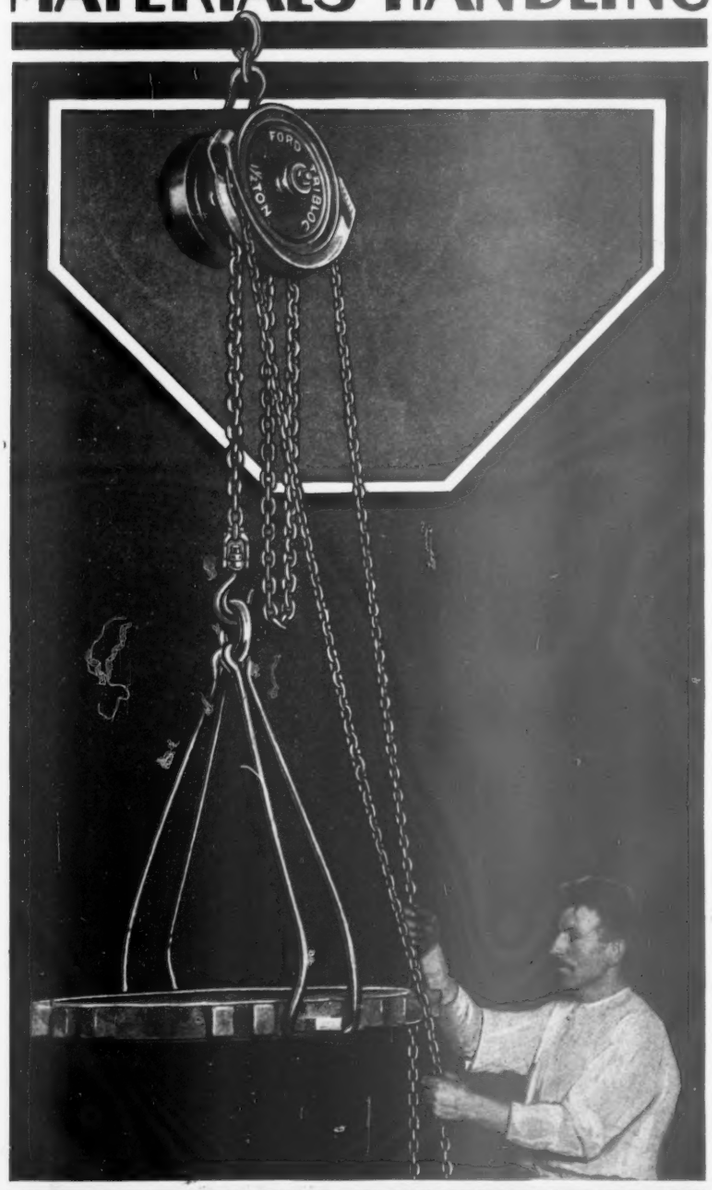
Check the equipment in which you are interested, tear out and return this page, with your name and address, to us, and we will send you complete information on the items checked.

The
PARKERSBURG RIG & REEL COMPANY
Executive Offices & Main Plant, Parkersburg, W. Va., U. S. A.
Sales Offices Maintained and Stocks Carried in Every Producing Field

FORD
TRIBLOCS for MATERIALS HANDLING



Ford Triblocs are safe, fast and easy to operate and are daily becoming more popular in every trade where there are lifting problems to be solved.

These Triblocs are available in sizes from 1/4 to 40 tons, together with a complete line of steel plate roller bearing trolleys.

FORD CHAIN BLOCK CO., PHILA., PA.

Name and address—	Barrels	Value
Dunigan Bros., Breckenridge	3,450.89	3,125.25
Double Five Oil Co., The, Amarillo	2,587.57	2,426.58
Deering, John A., Houston	9,143.50	11,799.12
E		
Ernest Oil Co., Rockdale	480.17	667.42
Evangeline Petroleum Co., Wichita Falls	2,425.50	2,425.50
Erickson, Selma E., Wichita Falls	77.95	119.78
Eastland Oil Co., The, Fort Worth	20,180.90	19,598.87
Easton, E. S., Wichita Falls	1,791.76	2,680.27
Eggers, J. E., trustee, San Antonio	741.45	810.58
Eddy Oil Co., Beaumont	1,524.65	1,829.58
Eureka Producing Co., Tulsa, Okla.	17,715.76	26,116.38
Empire Gas & Fuel Co., Bartlesville, Okla.	235,667.65	277,015.57
Electra Production Co., Inc., Electra	1,294.28	1,897.56
Erie Investments, Ltd. of Texas, Rockdale	565.84	726.93
Electra Gulf Oil Co., Electra	4,255.61	5,528.94
Ellis & Anderson, San Antonio	159.82	181.52
Eastern Petroleum Corp., Wichita Falls	2,162.32	3,076.92
Empire Holding Corp., Wichita Falls	941.67	1,120.63
East Batson Oil Co., Batson	22,770.32	27,324.69
Evangeline Petroleum Co., Wichita Falls	2,564.55	2,564.55
Evangeline Petroleum Co., Wichita Falls (6-30-28)	3,831.51	3,831.51
Ellison Oil Co., Rockdale	72.95	109.21
F		
Fox & Adams, Burkett	7,471.46	9,117.18
Ferguson & Watson, Electra (6-30-28)	1,458.76	2,042.22
Ferguson & Watson, Electra	1,299.16	1,964.57
Forster-Townsend & Ungren & Frazier, Putnam	628.50	940.76
Fort Bend Oil Co., Houston	7,055.99	8,238.85
Ferguson, W. R., Wichita Falls	495.39	733.28
Frontier Oil Co., San Antonio	12,198.02	15,352.29
Franklin, Wirt, Ardmore, Okla.	1,377.22	2,075.20
Four Oil Co., The, Wichita Falls	2,930.34	4,242.26
Falls Production Co., Wichita Falls	8,042.31	11,844.31
Flynn, W. B., Beaumont	4,421.79	5,424.48
Fountain Production Co., Saratoga	2,352.09	2,822.51
Fresno Oil Co., Wichita Falls	21,601.01	31,959.49
Frio Oil Co., San Antonio	221.55	178.50
Fort Ring Oil & Gas Co., Fort Worth	991.65	1,639.20
Freeman-Hampton Oil Corp., Wichita Falls	6,225.18	9,549.68
Foster, John F., receiver, Fort Worth	11,163.25	16,974.60
Farlyn Oil Co., Houston	16,473.57	10,589.11
Fisher, J. A., Wichita Falls	2,228.03	3,464.54
Farish & Ireland Lease, Houston	8,323.86	9,988.63
Fuchs, Fritz, Taylor (6-30-28)	149.09	192.45
Fuchs, Fritz, Taylor	226.00	306.10
Fendsland Oil Co. of Texas, Independence, Kans.	6,115.60	8,604.16
Fogle Oil Co., Minerva	1,656.90	2,209.58
Fain-McGaha Oil Corp., Wichita Falls	764,989.90	1,066,940.91
F. H. E. Oil Co., Sherman	183,195.55	131,531.54
Fleming & Kimball, Sherman	6,064.03	4,607.99
Fitzgerald Syndicate Lease, Wichita Falls	311.50	472.89
G		
Greene Production Co., Fort Worth	14,460.07	11,705.33
Gopher Oil Co., The, Amarillo	1,195.70	997.65
Gilliland, C. W., Wichita Falls	2,307.69	3,486.66
Gilliland, C. W., et al, Wichita Falls	14,290.88	22,402.50
Gibson Oil Corp., Amarillo	62,050.17	70,008.17
Gardner Bros. & Collins, Wichita Falls	1,659.41	2,314.11
Garrett, W. T., Eastland	1,667.83	2,318.52
Grayburg Oil Co., San Antonio	179,726.27	178,602.60
Grand Duke Producing Co., Muskogee, Okla.	16.785	21.99
Grayce Oil Co., Wichita Falls	39,300.41	57,399.69
Guaranty Oil Co., Electra	202.71	321.37
Golding Phillips Oil Co., Amarillo	613.30	378.29
Gardner, Wilson & McCaldin, Wichita Falls	2,697.24	4,012.62
Gwynn, P. F., Wichita Falls	13,979.53	22,031.80
Gwynn-Boyd Drilling Co., Wichita Falls	3,110.13	2,994.19
Gwynn, P. F., Ind. & Agt. J. F. Boyd, et al, Wichita Falls	1,810.35	2,761.14
G. & K. Production Co., San Antonio	1,470.08	1,713.33
Gholson, John M., Ranger	12,627.25	19,136.75
Golden West Oil Co., San Antonio	35,566.32	37,417.47
Glasscock Leasing Syndicate, San Antonio	1,952.43	2,265.57
Gordon, H. B., Jr., & W. B. Sharp, Houston	7,768.86	3,108.91
Gordon, H. B., Jr., & W. B. Sharp, Houston	33,259.86	39,458.71
Gordon, H. B., Jr., trustee, Houston	20,678.93	24,556.80
Golding & Cochran, Wichita Falls	24,441.61	32,996.17
Golding, Dudley S., Wichita Falls	10,296.40	13,363.65
Gates Oil Co. (Wyoming Corp.), Denver, Colo.	8,020.55	7,366.81
Gilman, R. F., Cisco	76.54	106.23
Gilman & McMurray, Cisco	15,271.74	23,760.90
Gulf Production Co., Houston	6,250,518.64	5,607,287.75
Goldelline Oil Corp., Oklahoma City, Okla.	9,160.51	9,502.07
Gultex Production Co., Waxachachie	2,574.02	3,996.24
Gates Oil Co., Ardmore, Okla.	3,509.42	5,584.89
Gilman & Conway Bros., Ranger	5,785.99	9,248.67
Galves Oil Corp., Tulsa, Okla.	5,186.00	7,197.23
Glass Bros., Rosebud	576.29	1,059.64
Gates-Bacon-Lea, Wichita Falls	9,853.03	13,629.68
Group No. 1 Oil Corp., Big Lake	354,809.63	429,596.46
Grady, D., Electra	337.45	523.63
Gunn Production Co., The, Cross Plains	1,571.27	2,094.37
Gholson, Thompson, Barkley & Crotty, Ranger	2,751.68	3,891.77
Ginter Lange Oil Co., San Antonio	1,644.00	2,052.26
Ginter Jones Oil Co., San Antonio	672.00	809.06
Gulf Coast Oil Corp., Dallas	12,044.27	14,453.12
Guthrie, Cole & Ferguson, Wichita Falls	780.44	1,096.72
Gaither Production Co., Rockdale	1,062.90	1,471.81
Godfrey, F. L., Enid, Okla.	88.12	135.59
Gainesville Oil & Development Co., The, Gainesville	1,318.96	1,301.60
Gilbert Co., The, Beaumont	5,608.31	6,729.98
Graham and Lash, Moran	200.34	296.64
Gallagher & Lawson, Desdemona	446.17	557.41
Godley Oil & Gas Co., Dallas	27,705.34	27,704.31
Gilbert, J. E., Carbon (6-30-28)	535.00	535.00
Gilbert, J. E., Carbon	445.00	445.00
Granite Oil & Gas Co., Ridgway, Colo.	453.60	698.31
Gordon Oil Co. of Texas, The, Logan, Ohio	81.24	118.61
Glenridge Oil Corp., St. Louis, Mo.	3,738.91	5,227.02
Gladis Oil Co., Saratoga	3,094.39	3,094.39
Gibson Oil Corp., Amarillo (1-1-27 to 6-30-28)	9,036.57	9,488.39
Greene Production Co., Fort Worth (Yr. 12-31-26)	4,440.16	9,193.72
Greene, Frank M., Fort Worth (Yr. 12-31-26)	1,316.80	2,620.26
Goolsbee & Graham, Wichita Falls	None Sold	
Graham, L., Wichita Falls	None Sold	
Gilliam Logan Oil Co., Fort Worth	3,140.83	2,901.58
Gandy, L. O., Wortham	2,846.24	3,709.67
H		
Hammon & Garrett, Wichita Falls	42,350.36	66,142.56
Hammon-Heyser & Garrett, Wichita Falls	13,307.65	18,573.59
Hammon, Heyser, Garrett & King, Wichita Falls	1,610.15	2,571.13
Hammon, Heyser & Garrett, Wichita Falls	1,470.88	2,184.39
Hammon & Heyser, Wichita Falls	1,729.44	2,497.13
Hammon, Wayne H., Wichita Falls	6,369.06	10,544.25
Humphreys Brothers, Inc., Houston	973.78	1,533.31
Henson, G. D. and E. V. Tidwell, Graham	4,076.92	5,789.46
Hitchman & Howard, Inc., San Antonio	2,216.15	3,085.45
Herbert Oil Co. of Texas, trustee, Fort Worth	10,824.55	15,674.60
Hoffman & Page, Eastland	2,333.35	3,271.25
Herogan Oil Co., Breckenridge	941.64	839.91
Horn, T. W., Houston	1,982.76	2,379.31
H. B. J. Oil & Gas Trust, Baltimore, Md.	2,345.32	3,660.49
Holbrook & Woods, Wichita Falls	18,195.46	26,339.63
Hughes, William K., trustee, St. Louis, Mo.	1,091.25	1,475.58
Harris & Simons, Tulsa, Okla.	7,068.58	3,965.48
Hughes, J. K., Oil Co., Mexia	29,967.00	40,404.30
Home Oil & Gas Co., Inc., The, Enid, Okla.	2,592.28	3,432.57
Hefley, McIntosh & Thomas Branch Lease, Cameron	655.85	870.13
Holmes & Huey, Amarillo	2,701.47	2,593.42
Hyde Production Co., Houston	4,252.62	5,103.16
Hyde, George, Houston	7,160.09	8,538.46
Hoppes, W. T., Burkburnett	195.04	250.13
Hamon, Jake L., Jr., Ardmore, Okla.	11,521.14	16,012.71
Huber, J. M., Co. of Louisiana, Inc., Breckenridge	306.06	400.25
Hereford Oil Co. & Optimist Oil Co., Electra	3,211.87	4,726.16
Hardie, J. M., & Co., Sour Lake	550.47	660.32
Houston Gulf Gas Co., Houston	14,223.66	14,223.66
Hope Oil & Gas Co., The, Fort Worth	13,771.95	18,884.35
Hyer, Fred, Fort Worth	522.85	827.52
Hardy Oil Co., Wichita Falls	3,507.53	5,226.53
Houston Production Co., Houston	16,139.47	19,565.47
Hull Oil Co., Beaumont	10,184.58	12,154.32

G-R Bentube Sections

The G-R Bentube Section is fully protected by U. S. Patent No. 1,617,083

MAINTAIN rated capacity even with poor quality cooling water because of the automatic scale-shedding feature which prevents scale from building up to a thickness which would reduce the cooling effect below that for which the sections are designed.

G-R Bentube Sections are standard and interchangeable, may be set up in stacks for flexible capacity, are built of Admiralty metal tubes and cast iron headers for long life, and have high salvage value because of the ease with which they may be dismantled, transported and re-erected as required by changes in plant layout.

The Griscom-Russell Co., 285 Madison Ave., New York

Philadelphia	Chicago		St. Louis	San Francisco
Boston	Cleveland		Kansas City	Los Angeles
Rochester	Indianapolis		New Orleans	Denver
Pittsburgh	Detroit		Houston	Tulsa
Massillon	Milwaukee		Atlanta	Seattle
Memphis	Minneapolis		Charlotte	Dallas
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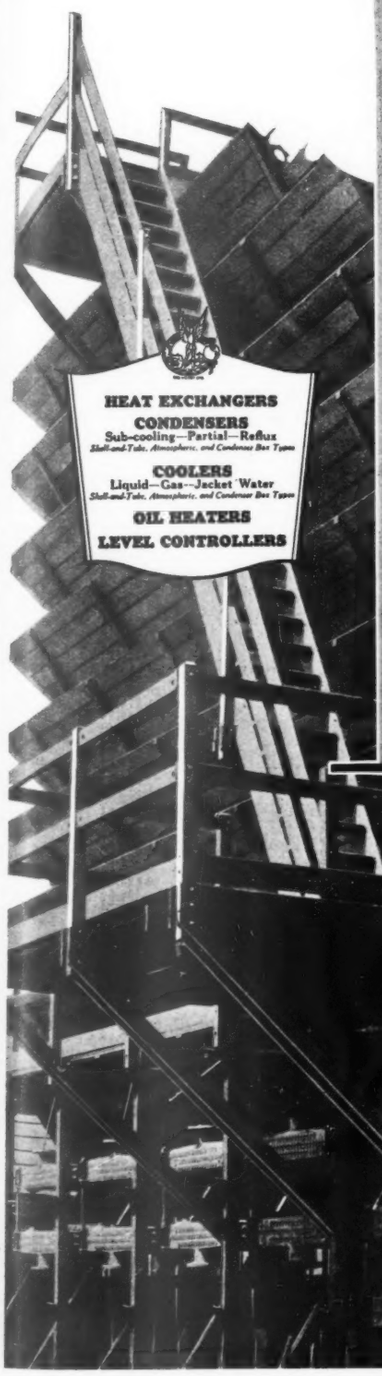
For Canada: Riley Engineering & Supply Co., Ltd., Toronto



Griscom-Russell

Heat Transfer Apparatus

Billions of Bubbles

If Airplanes could reach the Planets,

Here is where just one year's output of gasoline from Campbell Absorbers would take you:

Neptune, one-way trip	2,792,000,000	miles
Saturn, one-way trip	861,000,000	"
Jupiter, one-way trip	483,300,000	"
Mars, two round trips	566,000,000	"
Venus, two round trips	268,800,000	"
Sun, three round trips	557,580,000	"
Mercury, one round trip	71,400,000	"
Moon, four round trips	1,910,720	"
Around the Earth 928 times	23,008,400	"
Long Beach to Denver	880	"
	5,625,000,000	

Three gallons out of every four of California's Natural Gasoline Production are extracted by Campbell "Oil-Froth" Absorbers. There must be a reason.

"Billions of Bubbles" was written for you. Send for your copy.

J. A. Campbell

Natural Gas Engineer

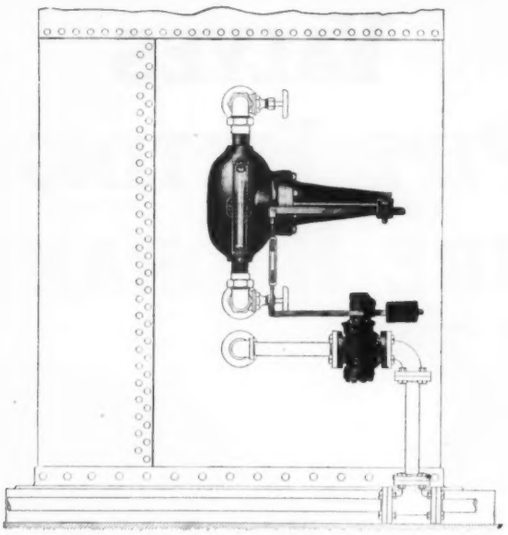
CONSULTING—DESIGNING—CONSTRUCTING

P. O. Box 669 Long Beach, Calif.

Campbell Oil-Froth Absorbers

Name and address—	Barrels	Value
Hobbs Oil Co., Tulsa, Okla.	2,551.53	3,641.13
Humble Oil & Refining Co., Houston	3,464,065.80	3,380,083.39
Harvey, R. A., Houston	1,481.00	1,722.23
Hanlon Gasoline Co., Tulsa, Okla.	1,164.88	1,532.53
Houseman, D. H., & Co., Dallas	24.75	34.64
Hamilton, W. R., trustee, San Antonio	4,636.38	6,301.95
Hobson & Vorhees, San Antonio	732.51	908.52
Humphreys Corp., Houston	50,337.53	63,620.23
Herrmann, et al, Pampa	62,633.25	83,751.32
Homaokla Oil Co., Oklahoma City, Okla.	5,036.50	7,091.13
Hampton & Wilson, Wichita Falls	3,042.47	4,200.36
Hill, W. R., trustee, Burkburnett	231.00	360.36
Houston Oil Co. of Texas, et al, Houston	52,864.81	56,167.42
Hamilton, Robert, et al, Smethport, Pa.	387.00	503.10
Hill & Dowell, Batson	14,485.11	17,382.13
Haynes, J. H., De Leon (Year 1927)	1,320.19	1,816.17
Houghland Production Co., Dallas	2,986.05	3,723.91
Helvetia Oil Co., San Antonio	13,628.66	15,169.06
Hedrick-Camp Drilling Co., Wichita Falls	6,260.09	6,159.93
Halmack Oil Co., Dallas	2,347.26	3,227.03
Hamilton & Martin, Wichita Falls	3,043.18	4,290.88
Hemby, J. M., Electra	927.11	1,384.32
Howard, Duffield & Berlin, Tulsa, Okla.	1,350.12	1,459.07
Hambleton, George, San Antonio	496.99	599.77
H-Y Oil Co., Fort Worth	8,975.24	12,837.56
Harwell Brothers, Abilene (3-31-28)	897.00	1,259.36
Harwell Brothers, Abilene (6-30-28)	1,026.00	1,302.28
Howard Petroleum Corp., Tulsa, Okla.	834.62	1,024.00
Holloway, R. R., receiver, Brownwood	560.68	756.70
Holloway, R. R., receiver, Brownwood (6-30-28)	643.68	868.96
Hickey, T. J., et al, Corsicana	61.84	84.14
Hammond, J. G., Fort Worth	241.53	346.64
Hobson & Vorhees, San Antonio (6-30-28)	652.43	802.78
Harrison Oil Co., Houston	105,900.56	150,546.68
Henshaw Oil Corp., San Angelo	21,324.22	28,614.32
Hughes, Charles, Eastland	324.44	414.48
Handrick, August, Moran	238.68	277.19
Hamilton, Robert, et al, Eastland (6-30-28)	404.00	526.20
Hamilton & Cooper, Olney (6-30-28)	486.86	671.12
Huseo-Ranger Oil Co., El Paso (6-30-28)	486.38	646.54
Hickory Oil & Gas Corp., Fort Worth (6-30-28)	44.23	55.28
Harris-Fisher Oil Co., Cisco (6-30-28)	593.28	796.10
Herd, A. T., Fort Worth (6-30-28)	31,737.01	30,442.75
Helf, C. H., Albany (6-30-28)	1,002.69	1,038.19
Howell, M. L., Lohn	522.00	684.00
Holmes & Riley, Amarillo	6,113.63	6,656.67
Hill & Riley, Amarillo	1,338.66	995.10
Hickok Prod. & Dev. Co., The, Toledo, Ohio	1,632.11	2,234.00
Hammond, L. P., Wichita Falls	5,299.64	7,383.42
Hughes, Charles, Eastland	409.80	618.79
I		
Interocean Oil Co., Tulsa, Okla.	13,907.78	19,396.11
Independent Oil & Gas Co., Tulsa, Okla.	17,831.28	21,621.30
Independent Oil & Gas Co., Tulsa, Okla.	628,203.82	402,675.90
Imperial Royalties Co., Kansas City, Mo.	21,371.02	16,059.29
Idaho Oil Co., San Antonio	1,384.07	1,656.22
Infield Petroleum Co., Austin	934.31	1,360.98
Irick Oil Co., Waskom	366.92	490.14
Ilseng Production Co., Fort Worth	581.31	836.46
Invador Drilling Co., Amarillo	186,146.93	164,694.67
Isaacs, B. K., Fort Worth	1,068.60	1,281.02
J		
Justin Oil Corp., et al, Wichita Falls	13,363.38	20,616.93
Julia Oil Co., Sour Lake	3,979.50	4,776.40
Jones, Edwin M., El Dorado, Ark.	20,882.42	29,013.71
Jackson Co., The, San Antonio	1,263.72	1,490.83
Johnson Brothers, San Antonio	8,030.93	10,041.65
Jackson, J. S., trustee, Sour Lake	3,489.00	4,186.79
Jones, J. E., Wichita Falls	1,707.17	2,584.61
Junior Oil Co., Houston	1,680.70	2,783.75
Jonray Oil Co., The, San Antonio	1,491.96	1,542.43
Judson Oil Co., Tulsa, Okla.	8,936.46	13,504.58
Jones, J. A., Moran	362.72	555.52
James, Tom, Albany	11,834.10	17,651.90
Jones, W. A., Minerva	859.46	1,021.51
Jackson, T. H., Sipe Springs	170.28	216.44
Jennings, J. C., Wichita Falls	793.78	1,037.18
Japhet Production Co., Houston	8,698.35	8,272.18
Janellen Oil Co (Inc. S. R. Walker), Tulsa, Okla.	267.00	320.40
Jacob Oil & Gas Co., Graham	358.36	500.65
K		
Kuhlemeier-Kleiner Oil Co., Cisco	754.16	963.60
Kirk & Evans, trustee, Gorman	3,681.57	5,241.20
Kingwood Oil Co., Okmulgee, Okla.	484.52	687.56
Keener Oil & Gas Co. of Texas, Tulsa, Okla.	5,175.56	7,167.79
King Royalty Co., Wichita Falls	54,917.26	82,130.42
Keystone Production Co. of Texas, Fort Worth	4,044.43	6,061.75
King & Daniel, Wichita Falls	8,447.95	13,104.51
Killam, O. W., Laredo	43,863.54	43,863.54
Koenig, Max W., San Antonio	20,107.74	20,107.74
Kershaw, L. R., Muskogee, Okla.	1,536.71	993.60
Kimmell & Wootter, Wichita Falls	598.69	894.29
King, Anna B., Muskogee, Okla.	515.64	326.62
Kistler, Frank E., & Co., Denver, Colo.	8,528.10	6,951.59
Kewanee Oil & Gas Co., The, Titusville, Pa.	103,287.30	140,854.87
Kaufman, L., San Antonio	513.76	522.29
Kone Production Co., San Antonio	59,466.77	93,894.04
Kluncke, George, Von Ormy	1,874.85	1,932.34
Klop, C. F., Electra	9,782.81	14,054.37
Kavanaugh Petroleum Co., Houston	3,077.48	4,262.04
Kent, G. C., Corsicana	26,493.83	37,394.19
Kurz Oil Co., Somerset	511.04	496.09
Kleiner, Charles J., Cisco	11,811.60	16,825.49
Kirby Petroleum Co., Houston	21,007.74	15,240.50
Kate Bell Oil Co., The, Dallas	1,120.68	1,654.81
Kleinfelder, B. F., Breckenridge	525.58	714.84
Kemrow Co., Wooster, Ohio	15,670.11	23,877.05
Kokomo Petroleum Co., Gorman	875.00	1,252.34
Kahle, Gracey & Diver, Bridgeport, Ill.	6,618.92	4,212.85
King, A. A., San Antonio (6-30-28)	305.58	367.99
King, A. A., San Antonio	330.32	296.14
Knotts, F. F., Wichita Falls	505.48	765.89
Kishi, K., Terry	536.68	644.01
Kerr, T. P., Corsicana	438.69	608.45
Kent-Middleton Refining Co., Corsicana	14,235.84	19,482.19
Keen & Woolf Oil Co., Shreveport, La.	20,994.33	25,193.20
Hendrick, P. S., Albany	100.60	101.66
Keller, J. E (6-30-28)	497.10	725.77
Kimball & Bostic, Burkburnett	2,107.69	3,077.25
L		
Leonard, George, Somerset	585.18	631.25
Leonard Oil Co., Somerset	215.96	250.52
Lamb, George E. and Superior Oil Prod. Co., Brownwood	231.59	319.17
Lawson, Eugene B., Tulsa, Okla.	93,316.12	129,157.67
Lomax, Thornton, Jr., Wichita Falls	3,552.98	6,458.11
Lubell, Samuel L., et al, Tulsa, Okla.	27,942.67	23,813.70
Lake View Oil Co., Sour Lake	15,366.02	18,439.22
Lowry Oil Corp., Wichita Falls	6,028.13	9,062.70
Lesh & McCall, Nocona	30,183.33	18,110.00
Lesh, Kilcrease & Co., Nocona	3,171.45	2,854.31
Lake Graham Oil Co., Houston	3,325.44	4,060.71
Laning, Mrs. R. A., Wichita Falls	5,746.31	5,917.66
Lesh, John I., & Co., Wichita Falls	13,363.23	8,774.78
Loewenstein Oil Co., Rockdale	1,540.82	2,080.30
Larkin, W. B., owner and trustee, Wichita Falls	406.18	600.37
Lewis, J. E., & Co., Eastland	3,986.86	5,710.92
Lewis, J. E., et al, Eastland	1,086.41	1,602.12
Liberty Oil & Gas Trust, Baltimore, Md.	679.38	904.93
Lake Erie Trust Co., The, trustee, Cleveland, Ohio	886.52	1,376.86
Langford, W. S., Wichita Falls	1,104.76	1,578.96
Lackey, W. G., Tulsa, Okla.	3,816.83	5,468.82
Lone Star Gas Co., Dallas	8,653.65	12,653.85
Lowe-Delaney & Carter, DeLeon	1,518.67	2,224.40
Louisiana Oil Refining Corp., Shreveport, La.	21,692.32	26,765.36
Linedo Oil Co., Lincoln, Nebr.	1,739.67	1,739.67
Levy, Leonard M., Trustee No. 2, Fort Worth	1,768.38	2,792.27
Levy, Leonard M., Trustee No. 1, Fort Worth	3,344.54	5,536.66
Little Flower Oil Co., St. Louis, Mo.	812.18	1,007.10
Laredo Oil Co., Laredo	1,928.35	1,928.35
Little Caddo Syndicate, Fort Worth	1,370.80	2,000.32
Lucey Petroleum Co., Dallas	483.22	641.74
Lebow, C. H., Tulsa, Okla.	1,214.76	1,896.12

Name and address—	Barrels	Value
Loggie & Arendt Oil Co., Albany	5,411.56	4,230.33
Lewin, Sam (Akers lease), Breckenridge	1,538.22	2,137.74
Lockhart & Co., El Paso	23,701.55	25,365.44
Long, Roy, Oil Co., Navasota	3,139.74	4,457.88
Lofors Petroleum Co., Lofors	214,929.00	278,509.55
Lee, Homer, Wichita Falls	1,620.65	2,471.95
Lackey, J. L., receiver, Stinnett	33,840.68	24,693.20
Lytle Oil Association, Lytle	278.50	272.22
Lytle, C. F., Mexia	12,093.48	16,184.86
Logan & Carter, Fort Worth	6,354.25	10,134.86
Lynch, John D., trustee, Sioux Falls, S. Dak.	2,238.86	3,335.88
Little Flower Oil Co., St. Louis, Mo.	236.90	308.92
Lee & Simon, Cisco	172.80	240.20
Len-Cook Oil Co., Electra	668.04	1,022.40
Lain Oil Co., San Antonio	1,303.44	1,548.96
Leiser-Rochmill Production Co., Inc., Fort Worth	2,267.15	3,229.51
M		
Massie, J. H., Wichita Falls	18,435.11	27,725.35
Mimtex Oil Corp., Wichita Falls	993.71	1,004.45
McBride, W. C., Inc., St. Louis, Mo.	7,377.49	9,737.72
McKanna, James E., agent, Wichita Falls	20,809.30	29,257.87
Mennis, G. W., Wichita Falls	4,395.56	6,270.94
Maxwell, J. C., Fort Worth	97,308.27	64,519.01
Monarch Royalty Corp., Kansas City, Mo.	30,563.00	24,894.62
McLester Oil Co., Eastland	26,983.20	41,486.68
McCall, C., trustee, Nocona	1,144.38	1,029.94
Moss & Urschel, Dallas	21,036.52	28,702.72
Moss, H. S., Dallas	13,604.41	18,212.14
McJunkin, Florence T.	557.17	901.82
Midwest & Gulf Corp. of Texas, Tulsa, Okla.	1,285.62	1,460.90
McCormick & Noack, Rockdale	70.40	95.73
Meredith, J. D., Moran	5,129.78	5,738.81
Moore, N. A., Eastland	2,645.98	3,705.61
McCutchen, C. E., trustee, Wichita Falls	9,740.11	14,346.37
Morton, A. D., Bartlesville, Okla.	913.79	1,214.46
McLester Oil Co., Breckenridge (6-30-28)	4,878.00	6,623.08
McLester Oil Co., Breckenridge	4,493.00	5,922.70
Moore, F. L., trustee, Tulsa, Okla.	2,819.84	4,005.51
Moran, W. J., Wichita Falls	3,130.91	4,843.83
Merrick and Bristow, Ardmore, Okla.	31,245.28	22,647.39
Merrick and Lamb, Ardmore, Okla.	13,408.26	10,726.60
Mann, F. A., Graham	1,207.16	1,894.99
Mayberry, C. R., & Co., Laredo	4,366.09	4,366.09
Minnehoma Oil & Gas Co., Tulsa, Okla.	8,803.34	7,139.06
Murko Oil & Royalty Co., Dallas	16,414.65	24,790.34
Meridian Petroleum Corp., Tulsa, Okla.	3,827.31	5,249.61
Marshall, George S., Laredo	15,227.80	15,227.80
Mayfield, O. F., et al, Cushing, Okla.	382.90	201.52
McMurray, J. L., et al, Cisco	2,949.25	4,432.74
Mendendall Oil Co., Cisco	2,608.81	4,128.87
Magnolia Petroleum Co., Dallas	2,957,372.89	3,113,408.50
Medina Oil & Gas Association, San Antonio	231.31	260.21
Maer & Staniforth, Wichita Falls	1,872.32	2,425.24
McNamara Oil Co., Beaumont	2,700.77	3,240.92
Mitchem, G. P., Cisco	927.09	1,291.77
M. & V. Oil Co., Wichita Falls	5,470.04	8,203.79
Mook-Texas Oil Co., Fort Worth	11,399.09	16,428.64
McCrary, E. W., Tulsa, Okla.	4,338.03	5,888.51
Matador Oil & Gas Co., Quanah	238.50	357.66
McDaniel Oil Corp., Cisco	5,028.30	8,111.86
Mid-Continent Petroleum Corp., Tulsa, Okla.	12,948.43	18,102.43
Montgomery-Rea-Montgomery, Sedwick	2,161.22	3,088.53
Macknold Co., San Antonio	262.50	287.02
Medio Oil Co., San Antonio	1,032.00	1,289.99
Maubrey & Snyder, Abilene	392.08	514.19
Mid-Kansas Oil & Gas Co., Findlay, Ohio	1,365,334.30	912,406.78
McCaty Oil Co., Wichita Falls	86,031.82	135,544.23
Mordyan Petroleum Co., Pampa	20,981.58	28,535.24
McMan Oil & Gas Co., Tulsa, Okla.	595,565.11	454,866.39
Marnet Oil & Gas Co., Tulsa, Okla.	4,614.48	6,376.55
McIlroy Oil Co., Inc., Amarillo	76,574.08	65,880.23
McNallen & Letwin, Breckenridge	1,161.44	1,554.83
Miller & Miller, Putnam	301.08	439.05
Moore, C. O. Oil Corp., St. Louis, Mo.	7,354.26	9,535.70
Madison Oil & Gas Co., Electra	6,589.99	10,258.87
McNallen & Griffin, Tulsa, Okla.	3,763.82	5,049.68
Midwest Exploration Co., The, Amarillo	118,690.24	138,809.08
Midland Oil Co., Fort Worth	39,933.05	63,333.82
Meredith & Gant, Wichita Falls	2,546.76	3,119.33
Milham Corp. of Texas, San Antonio	20,660.94	29,959.07
Marland Production Co., Ponca City, Okla.	1,305,663.44	1,124,680.44
Minerva Petroleum Co., Minerva	879.09	1,221.35
McCullough, Everett, Wichita Falls	99.03	110.52
McDonald, W. W., et al, Dallas	4,678.77	6,664.33
Minor Oil Co., Beaumont	9,625.86	11,551.03
Manning, R. H., Fort Worth	85.88	111.73
Marquette Oil Co., Tulsa, Okla.	5,765.41	6,865.04
May, F. N., Santa Anna	260.64	347.95
Mecom Oil Co., Liberty	4,133.67	4,960.40
Martin, Drake & Jones, Houston	7,118.73	8,542.47
McDonald, A. C. and M. C., Putnam	4,612.08	6,666.35
Muss & MacDermott, Fort Worth	386.90	515.74
McCarter, R. C., Cisco	390.36	559.53
Mills & Garitty, Corsicana	1,832.18	2,290.22
McChesney, Nancy, Olney	5,691.57	8,730.86
Mason, J. F., Fort Worth	1,744.00	2,609.30
Magee Brothers, Electra	1,027.49	1,587.19
Maddox, Tom, Pumpville (3-31-28)	206.46	222.97
Maddox, Tom, Pumpville (6-30-28)	108.71	113.05
Madden and Hunt, Olney	2,861.79	4,006.50
McDaniel Oil Corp., Cisco (6-30-28)	6,058.60	8,778.27
Monarch Royalty Corp., Kansas City, Mo.	21,352.00	15,186.31
Moutray Oil Co., Abilene	80,756.32	117,960.27
Moody Corp., Houston	309,857.27	371,675.72
Madden and Hunt, Olney	3,091.78	4,700.69
Madden and Hunt, Olney	2,829.76	4,507.99
McGinley-Sigler Co., Fort Worth	182.83	95.99
McCoy, J. H., Tulsa, Okla.	146.88	222.51
Murchison Oil Co., Dallas	211,366.70	98,609.94
McGraw Oil Co., Tulsa, Okla.	1,857.11	2,464.34
Matador Oil Corp., Amarillo	43,098.25	20,027.17
N		
Necessity Oil Corp., Eastland	1,530.93	1,961.59
Nimrod Oil Co., Dallas	219.04	346.96
Noack & Lanning-Shelton lease, Rockdale	405.08	534.70
Noack & Lanning-Phillips & Perry, Rockdale	75.89	103.22
Noack Oil Co., Rockdale	2,112.26	2,893.79
Nutt & Gates, Wichita Falls	1,596.88	2,486.04
Naboh Oil & Gas Co., Amarillo	14,529.13	19,615.67
Norman Oil Co., Wichita Falls	1,275.84	1,885.96
New Domain Oil & Gas Co., Pittsburgh, Pa.	5,201.04	5,015.89
Nunn & McAuley Oil Co., Amarillo	10,842.48	11,941.66
North Fork Oil Co., Amarillo	4,076.00	4,867.08
Pardue, William, Jr., Breckenridge	3,105.28	4,472.98
Newport & Ohio Petroleum Co., Newport, N. Y.	351.51	498.84
Noble Oil & Gas Co., Tulsa, Okla.	3,292.29	4,561.27
National Petroleum & Refining Co., Wichita Falls	563.31	821.37
Number Nine Oil Corp., Tulsa, Okla.	2,534.56	3,728.41
Navarro Oil Co., Houston	176,570.81	222,802.29
Newton Palmer Oil Co., Rockdale	591.19	812.16
National Oil Co., San Antonio	849.42	874.09
O		
Omohundro, W. B., Wichita Falls	26,512.96	39,928.33
O'Neil, John, Wichita Falls	13,869.60	20,272.83
Oldom, William F., Iowa Park	2,170.00	3,349.07
Offenbacher, Emil, Tulsa, Okla.	152.67	211.35
Ocean Oil & Refining Co., El Paso	1,075.37	1,096.87
Ohio Somerset Oil Co., San Antonio	1,450.52	1,523.05
Owens Oil Co., Brownwood	877.90	911.24
Owen-Sloan Oil Co., The, Big Spring	8,851.16	7,112.93
Omilak Oil Co., Spokane, Wash.	256.58	297.64
Osage Development Co., Bartlesville, Okla.	1,327.23	1,327.23
Olean Petroleum Co., Bristow, Okla.	27,509.03	19,984.18
Osborne, R. R., et al, Amarillo	2,272.30	2,918.26
Orange Petroleum Corp., Orange	32,600.69	38,945.72
Old Colony Oil Co., Dayton	1,795.96	2,155.15
Oriental Oil Co., Dallas	545.48	717.14
Old Ocean Oil Co., Kansas City, Mo.	4,059.09	4,046.86
Olney Oil & Refining Co., Olney	595.46	889.62
Orient Oil Operating Organization, Wichita, Kans.	19,859.37	13,901.56
Owenwood Pool No. 3, J. W. Robins, trustee, Fort Worth	4,300.77	5,791.43
Oktaha Co., The, Tulsa, Okla.	857.93	1,260.87



Installation of a Mason No. 290 Liquid Level Control on an absorber tower.

Dependable liquid level control

Where it is inadvisable to place the float inside the liquid container the Mason Liquid Level Controller maintains any predetermined level in stills, receivers, absorber towers, heaters, condensers, closed tanks, etc. It is built to control gasoline, oil, water and other fluids and is often used as a drainer in handling large volumes of condensate from evaporating plants, heaters and condensers requiring a valve of large port area. The leverage of the rotary balanced valve has been considerably increased, making its action more positive, and sticking which was common with the yoke type has been eliminated.

Sturdily built, the Mason No. 290 Controller is unusually sensitive in its action and the slightest change in liquid level causes the float to rise or fall, opening or closing the balanced valve.

Furnished with special trim for corrosive liquids or gases when necessary.

Write for a copy of new Bulletin 290 which gives a complete description of the installation, operation, and maintenance of this Controller, together with prices, weights and roughing in dimensions.

Complete unit, float chamber and balanced valve. Any type balanced valve may be used.

Mason Regulators

MASON REGULATOR CO.
Boston, Mass.

Atlas Supply Company
Muskogee, Oklahoma

Warren & Bailey Company
Los Angeles, California

Pelican Well, Tool & Supply Co.
Shreveport, La.

J. A. Rossiter Company
Houston, Texas

2454

VALVES
PIPE FITTINGS
FIRE HYDRANTS

KENNEDY

KENNEDY Malleable Iron Pipe Fittings are made of truly malleable metal, carefully proportioned for ample strength, with accurately tapped and generously chamfered clean sharp threads. They go on the pipe easily, screw up tight without strain, and assure properly aligned trouble-free pipe fitting jobs.

Besides malleable iron fittings, the Kennedy line also includes gate, globe and angle valves for every producing, refining and pipe line service. Try Kennedy Fittings and valves on your next job. The Kennedy catalog describes and lists them fully and will be sent on request.

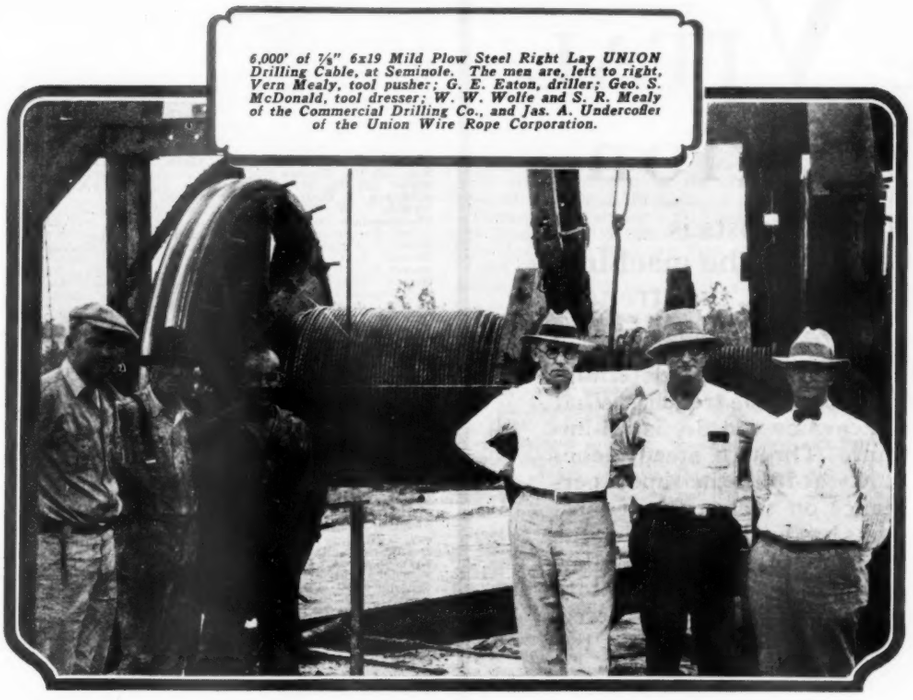
Send for the Kennedy Catalog.

THE KENNEDY VALVE MFG. CO., ELMIRA, N.Y.

WAREHOUSES: New York, 128-132 White St.; Chicago, 1335-1337 So. Clinton St.; San Francisco, 448-450 Tenth St.

SALES OFFICES: New York, Boston, Philadelphia, Cleveland, Chicago, Atlanta, Salt Lake City, El Paso, Los Angeles, San Francisco, Seattle.

Name and address—	Barrels	Value
Oil Investment Co., Wichita Falls	3,443.19	4,912.3
Ocean Oil & Refining Co., El Paso	1,164.33	1,292.4
Ocean Oil & Refining Co., El Paso (6-30-28)	990.06	1,049.4
Operators Oil Co., Tulsa, Okla. (6-30-28)	18,100.51	20,832.5
Overbey, J. D., Iowa Park	603.45	920.3
Oil Operators Trust, Fort Worth	27,208.18	30,924.2
P		
Pace, George L., Wichita Falls	907.37	1,326.9
Palmer, Freddie, Oil Co., Rockdale	153.00	181.3
Prairie Lea Production Co., San Antonio	12,612.62	12,612.6
Poole, B. O., Batson	911.08	1,130.1
Prescott-Phoenix Oil & Gas Co., Muskogee, Okla	16.78	21.9
Poor Boy Oil Co., Rockdale	543.68	706.7
Phillips Petroleum Co., Bartlesville, Okla.	1,630,937.80	1,867,298.7
Powers Production Co., Houston	1,906.47	2,080.5
Pitzer & West, Breckenridge	22,808.72	33,756.9
P-M Drilling Co., Chelsea, Okla.	264.91	382.5
Phillips, W. G., and J. B., Miliam, Chelsea, Okla.	74.83	103.3
Petroleum Producers Co., Wichita Falls	128,654.31	137,448.6
Producers Drilling Co., Wichita Falls	10,626.25	15,611.9
Pace and Ward, Breckenridge	2,289.18	3,204.8
Phillips, J. R. (Heywood), Amarillo	16,463.29	16,506.2
Phillips, J. R. (Invader Drilling Co.), Amarillo	14,071.59	11,613.3
Phillips, J. R. (Phillips-Currie Co.), Amarillo	8,208.37	8,909.7
Phillips, J. R. (Blasdell), Amarillo	452.73	299.3
Philp Brothers, Beaumont	3,421.01	4,106.2
Paggi, Chas. & Co., Beaumont	883.37	1,060.0
Paggi Brothers Oil Co., Beaumont	15,663.18	18,726.0
Perkins and Cullum, Wichita Falls	45,797.68	68,966.0
Perkins, J. J., Wichita Falls	3,267.14	4,766.7
Producers Supply & Tool Co., The, Marietta, Ohio	3,242.22	4,883.6
Pilkinton, F. L., Burkburnett	2,872.46	4,050.1
Pols and Johnson, Wichita Falls	831.74	1,266.8
Pois, M., trustee, Wichita Falls	314.91	436.6
Pois, Fine and Schulz, Wichita Falls	1,436.38	2,176.9
Pois, M., et al, Wichita Falls	4,257.03	6,013.2
Pickens & Lewis, Dallas	694.76	1,014.9
Preston Oil & Gas Co., Brownwood	362.11	456.1
Py-Tex Oil Co., Winchester, Ky.-Brownwood	1,288.49	2,106.7
Pivoto, M. E., Sour Lake	3,496.59	4,195.9
Prairie Oil & Gas Co., Independence, Kans.	79,350.86	95,120.2
Prairie Oil & Gas Co., Independence, Kans.	1,351,457.79	1,208,479.6
Putnam Oil Co., Tulsa, Okla.	54,499.91	77,608.4
Pioneer Oil, Gas & Refining Co., Danville, Ill.	1,227.11	1,317.6
Paull Oil Co., Graham	17,255.40	26,631.9
Petroleum Investment Co., Fort Worth	3,328.90	5,008.8
Pandem Oil Corp., Wichita Falls	27,658.20	39,941.9
Palmer & Burch, Inc., Wichita Falls	18,095.71	27,079.1
Pennock Oil Corp., Tulsa, Okla.	20,374.37	24,840.7
Panhandle Refining Co., Wichita Falls	119,923.62	176,847.2
Parks, J. T., et al, Henry Riley, receiver, Amarillo	11,330.93	15,628.4
Peery, Thos. H., Wichita Falls	1,244.12	1,884.6
Piney Oil & Gas Co., New York, N. Y.	7,125.92	5,656.4
Portland Drilling Corp., Wichita Falls	1,040.86	1,517.8
Pure Oil Co., Chicago, Ill.	1,902,587.60	1,571,277.5
Powell, J. L., Wichita Falls	487.84	701.7
Price-Russell & Co., Ranger	4,606.00	7,365.4
Progressive Production Co., Kansas City, Mo.	1,735.76	2,654.9
Paraffine Oil Co., Houston	13,415.80	16,098.9
Parry Oil Co. of Texas, Inc., Fort Worth	558.16	771.8
Payne, F. G., et al, Wichita Falls	2,887.74	4,513.7
Pollard, W. E., and C. E., Pampa	8,207.28	10,430.6
Pemeta Oil Co., Fort Worth	6,608.50	9,424.8
Piper, L. E., trustee, Vernon	1,717.14	2,457.4
Parton, A. T., (Ama-Gray Oil Co.) Amarillo	4,345.00	5,064.6
Petroleum Venture Co., Somerset (3-31-28)	297.30	319.6
Petroleum Venture Co., Somerset (6-30-28)	293.66	356.1
Prescott-Pheonix Oil & Gas Co., Wichita Falls	140.28	185.1
Producers Credit Co., Llano	1,679.69	2,334.7
Pantex Oil Co., Fall River, Mass.	18,633.00	21,180.9
Pennowa Oil & Gas Co., Skiatook, Okla.	21,143.16	23,299.9
Q		
Quartet Oil Co., Tulsa, Okla.	7,386.06	11,799.2
Quinn, J. W., et al, Eastland	12,293.20	20,477.0
R		
Ramsey & Decker, Breckenridge, (⅝ of 7,074.93 bbls.)	3,796.80	6,704.4
Ramsey & Decker, Breckenridge	1,775.90	2,555.7
Red Bank Oil Co., Tulsa, Okla.	22,208.67	32,109.2
Rock Island Oil Co., Amarillo	759.38	727.3
Relief Oil Co., Amarillo	10,038.08	10,385.5
Rockdale Oil Co., Rockdale	157.00	194.7
Ramsel, W. T., Oil Co., Rockdale	2,155.16	2,952.5
Roxana Petroleum Corp., St. Louis, Mo.	4,096,142.51	2,758,380.2
Rock Creek Oil Corp., Amarillo	13,329.17	10,210.2
Rockdale Junior Oil Co., Rockdale	361.59	480.9
Russell & Wilson, Wichita Falls	5,325.88	7,125.8
Rosenberg, Jacob, Tulsa, Okla.	92.71	121.3
Rosenberg, Jacob, trustee, Tulsa, Okla.	32.78	43.2
Ryan Consolidated Petroleum Corp., Bartlesville, Okla.	67,894.17	95,499.0
Rhodes and Highers, Breckenridge	8,972.93	12,453.7
Ray & Massie, Wichita Falls	26,590.75	23,677.5
Rex Petroleum Corp., Orange	23,642.09	28,370.5
Rathke Oil Co., Wichita Falls	24,357.19	36,348.3
Robinson, Arthur D., Dallas	11,214.63	13,247.4
Root & Rhodes, et al, Eastland	17,341.00	27,101.0
Root, C. M., et al, Eastland	14,174.00	20,754.0
Root, C. M., et al, Eastland	9,834.00	14,897.0
Root, C. M., Eastland	7,092.00	11,052.0
Root and Rhodes, Eastland	5,339.00	7,987.0
Rycade Petroleum Corp., Houston	172,970.12	202,070.6
Riner & Bailey, Wichita Falls	24,736.15	36,874.5
Ruyle Farm & Oil Co., Wichita Falls	7,610.80	11,585.7
Ramming, Staley & Ramming, Wichita Falls	679.97	968.6
Ramming, R. W., Wichita Falls	8.06	10.0
Ramming, W. F., Wichita Falls	38.38	55.0
Ramming & Saunders, Wichita Falls	3,800.82	5,807.7
Reeder, R. S., et al, Wichita Falls	7,749.04	11,665.4
Reeder & Scarborough, Wichita Falls	1,373.81	1,761.0
Ross Segunda Oil Co., Laredo	844.21	844.2
Ross, James F.,-Poor Boy Lease, Laredo	608.13	608.1
Ross, James F.,-Jones Mercedes Lease, Laredo	832.01	832.0
Ross, James F.,-Jones Garcia Lease, Laredo	607.63	607.6
Ross, Amigos Oil Co., Laredo	11,848.79	11,848.7
Robert Oil Corp., Breckenridge	46,640.27	71,816.6
Rockwell, J. A., & Co., Warren, Pa.	4,658.76	6,353.1
Rex-Tex Oil Co., Brownwood	1,288.49	2,106.7
Regna Oil Co., Saratoga	1,789.25	1,859.0
Reno Oil Co., Wichita Falls	68,310.16	103,509.0
Reclamation Co., The, Fort Worth	7,722.74	10,721.0
Reserve Petroleum Co., Tulsa, Okla.	687.61	1,036.2
Republic Production Co., Houston	1,219,617.75	962,199.9
Red River Oil Co., Tulsa, Okla.	16,977.28	25,145.8
Ross & Slicker Oil Co., Cisco	716.18	1,047.8
Ross, C. E., Burkburnett	501.38	715.2
Reiter-Foster Oil Corp., Tulsa, Okla.	7,335.62	10,725.6
Ranell Co., The, Oklahoma City, Okla.	7,368.15	10,845.6
Rhader & Carey, Wichita Falls	6,945.46	9,445.5
Rio Bravo Oil Co., Houston	436,593.44	540,819.2
Ruby Oil Co., Minerva	319.42	437.8
Ruthada Oil Co., Oklahoma City, Okla.	16,135.43	18,061.0
Rowe, J. G., Wichita Falls	758.12	1,045.5
Reinhart, M. J., trustee, Oklahoma City, Okla.	575.24	848.5
Roeser & Pendleton, Inc., Fort Worth	403,282.37	586,163.0
Rentex Oil Co., San Antonio	8,838.04	9,254.1
Rountree, White & Simpson, Rockdale	1,084.93	1,467.9
Ramsey, E. H., Rising Star	642.46	996.4
Rubsam & Hunter, Wichita Falls	2,420.11	3,642.7
Rowe, M. D., Wichita Falls	1,200.94	1,632.5
Rock Creek Oil Co., Amarillo (6-30-28)	16,567.19	12,363.6
Red Hill Petroleum Corp., Los Angeles, Calif.	None	None
Robinson, O. D., Pittsburgh, Pa.	1,953.92	2,129.7
Rochmill, Henry, trustee, Fort Worth	640.11	768.1
S		
Stratton, E. L., Fort Worth	646.56	693.7
Stephens & Fisher, Wichita Falls	774.47	1,187.8
Sunny Jim Oil Co., Tulsa, Okla.	7,754.64	6,112.3
Shamrock Co., Inc., The, Wichita Falls	349.05	492.5
Slick, T. B., et al, Oklahoma City, Okla.	7,100.37	10,724.9
Skelly Oil Co., Tulsa, Okla.	1,278,603.45	960,661.9



6,000' of 7/8" 6x19 Mild Plow Steel Right Lay UNION Drilling Cable, at Seminole. The men are, left to right, Vern Mealy, tool pusher; G. E. Eaton, driller; Geo. S. McDonald, tool dresser; W. W. Wolfe and S. R. Mealy of the Commercial Drilling Co., and Jas. A. Undercoffer of the Union Wire Rope Corporation.

"A Dandy Line-Giving Perfect Satisfaction"

"A dandy line—giving perfect satisfaction in 5,375 feet of 8-inch hole" .... thus the crew pictured above described the UNION Drilling Cable.

It is not surprising that similar praise for the performance of UNION Wire Lines comes from field men throughout the oil country. Our executives are practical oil men. Our engineers have had wide experience with oil field wire rope problems and requirements. Our modern plant has every facility for quality wire rope manufacture, from drawing and tempering the wire to the fabrication of the finished rope. In design, materials and construction, every UNION Wire Line has been developed to a highly perfected suitability for its particular service.

TRADE MARK

Operators are invited to test UNION Wire Lines in actual field service to discover for themselves the special fitness of these lines for oil industry work.

UNION WIRE ROPE CORPORATION
3 North Madison Av., Tulsa, Okla.

JARECKI MFG. COMPANY, Oil Country Distributors, Stocks at all stores.

Oil Country Sales Office:
820 Kennedy Bldg., Tulsa

Factory:
21st and Manchester Av., Kansas City

Branch Offices and Warehouse:
515 22nd St., North, Portland, Ore.

UNION WIRE LINES

The VITAL Question

in excavation costs is
Not the cost of the machine
But the cost of the trench

What the excavator costs is of minor importance in determining the cost of the trench. What the excavator can do, is all-important. Through steady, consistent, at-it-all-the-time performance on thousands of jobs, Parsons has won a reputation for digging more dirt per dollar. That's why so many contractors say that, whenever there's trench to be dug, your best bet is a Parsons.

1929 CONVENTION & ROAD SHOW A.R.B.A. JAN. 14 - 18 CLEVELAND, O

THE PARSONS COMPANY
Newton, Iowa
805 Mayo Bldg., Tulsa, Okla.

Sales Offices in Other Principal Cities

HOT RIGHT NOW— READY TO GO

STANDARD "TAR-BABY" HEATERS

are built to deliver quick and terrific heat, almost instantly. New advanced ideas in Heater Construction insures 100% performance. Always on the job. *Big saving in time and labor.* QUALITY built into every Heater makes for increasing popularity and demand. They do deliver "Hot Stuff" quicker.

"STANDARDIZE ON STANDARDS"

If you want more speed on that pipe line job—Figures prove a *"Standard"* soon pays for itself.

MODEL "D"
Built in 3 sizes: 250 Gal., 500 Gal., 1,000 Gal. — Oil Burning only.

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STANDARD SUPER-HEATERS

are made in sizes and types to meet every demand. You don't pay for idle time with a *"Standard"* on the job. No gangs of men waiting.

WRITE TODAY for complete specifications and prices. Whatever your requirements it will pay you to investigate "Standard" equipment. Let us prove to you that "Standards" will speed up your pipe line work—do it better—save you money. Address Dept. 1105.

Standard Steel Works
North Kansas City, Mo.

Name and address—	Barrels	Value
Staley, J. I., & Co., Wichita Falls	4,151.85	5,883.56
Staley, Wynne & Co., Wichita Falls	74,545.48	97,555.05
States Oil Corp., Eastland	42,245.71	64,188.01
Sheldon, C. P., Electra	10,042.47	14,561.09
Summerfield Oil Co., Tulsa, Okla.	253.50	371.18
Stekoll, Harry, Borger	2,567.33	2,592.69
Schoolfield, R. E., Wichita Falls	252.64	347.86
Sullivan, M. J., Kansas City, Mo.	369.74	487.05
St. Marys Oil & Gas Co., St. Marys, W. Va.	30,706.60	36,161.54
Shaw Oil Co., Wichita Falls	28,380.66	44,496.14
Stoops, J. P., Ranger	291.14	376.40
Shertzer Bros., Dewey, Okla.	14,850.43	21,533.35
Smith, McIntosh and Thomas Branch Lease, Cameron	1,800.46	2,484.72
Smith, McIntosh & Thomas (Henry Lease), Cameron	729.98	978.31
Sandefer-Atkinson-Daniel Oil Corp., Breckenridge	11,985.32	16,433.63
Schermerhorn Oil Co., Tulsa, Okla.	66,179.86	44,407.68
Shasta Oil Co., Wichita Falls	598.30	849.30
Stock, H. I., Cisco	2,307.00	3,358.60
Shelby Oil & Gas Co., Tulsa, Okla.	7,419.92	11,735.82
Sun Oil Co., Dallas	508,481.33	618,816.51
Sigler Oil Co., Wichita Falls	1,388.40	1,748.47
Stribling, J. C.-Hautier No. 1 well, Llano	1,729.95	2,404.62
Snider, C. W., Wichita Falls	1,417.76	2,208.49
Swensondale Oil Co., Caddo	9,675.77	12,422.53
Stout Petroleum Co., Brownwood	64.08	77.55
Scott & Walker, Albany	2,915.02	3,292.92
Stovall, E. C., Graham	46,410.33	69,340.98
Sneed Royalty Co., Tulsa, Okla.	200.44	313.69
Spring Creek Oil Co., Amarillo	7,164.29	7,450.62
St. Albans, Edward, Laredo	586.97	586.97
Shasta Oil Co., Laredo	645.62	645.62
Schimmel Production Co., Fort Worth	31,336.85	39,158.80
Simms Oil Co., Dallas	1,107,076.97	875,204.14
Scarborough, W. A., Burkburnett	2,245.61	3,312.29
Scarborough, W. A., et al, Burkburnett	746.70	959.50
St. Louis Oil & Development Co., Wichita Falls	410.82	571.95
Star Drilling Co., Wichita Falls	5,019.16	7,606.82
Stroube & Stroube, Corsicana	42,427.62	58,092.86
Saratoga Oil Co., Wichita Falls	1,116.30	1,698.49
Superior Oil Producing Co., Wichita Falls	2,850.64	4,194.62
Schaffner, E. N., et al, Cross Plains	1,384.99	2,096.72
Schaffner, E. N., et al, Cross Plains	159.12	158.75
Sun Burst Oil Co., Amarillo	5,274.70	4,315.22
Supreme Oil Co., Orange	2,593.63	3,112.54
Sink, Joel, Corsicana	209.00	305.00
Shaw, T. G., Fort Worth	158,818.00	194,543.96
Somerset Oil Co. of Mass., Easthampton, Mass.	119.44	116.18
Southern Crude Oil Purchasing Co., Shreveport, La.	2,606,646.20	1,659,167.47
Swanner, John L., Wichita Falls	2,551.08	3,762.88
Smith-Hanlon, Inc., Tulsa, Okla.	21.06	26.96
Fand Creek Oil Co., Amarillo	3,532.46	3,391.16
Seybert Bros., Mooringsport, La.	2,398.83	3,766.18
Southern Petroleum Exploration, Inc., Sistersville, W. Va.	5,418.76	6,634.20
Seaboard Oil & Gas Co. of Texas, Wichita Falls	31,927.95	44,245.88
Smith, E. L., Oil Co., Inc., Mexia	175,483.68	209,321.43
Sedwick Oil Co., Tulsa, Okla.	14,743.80	19,656.24
Snowden & McSweeney Co., New York, N. Y.	77,652.31	112,538.64
Sida-Tex Petroleum Co., Amarillo	29,431.41	39,779.23
Sinclair Oil & Gas Co., Tulsa, Okla.	149,611.61	228,961.38
Steed, Paul P., and A. R. Gaus, Wichita Falls	1,015.02	1,472.12
Steed, Paul P. (Perkins lease), Wichita Falls	1,753.71	2,521.03
Steed, Paul P. (D. W. Fish Lease) Wichita Falls	560.12	730.53
Slicker, Homer, Cisco	1,064.13	1,361.62
Somerset Crude Oil & Refining Co., Somerset	3,233.32	3,698.27
Syndicate Oil Corp., Rochester, N. Y.	977.92	1,501.96
Stella Oil Co., Beaumont	18,163.58	21,796.30
Summit Oil & Refining Corp., Amarillo	7,562.05	7,723.09
Shattuck, R. H., Dallas	2,879.65	3,987.69
Sinclair Oil & Gas Co., Houston	168,786.50	202,066.75
Strip, Geo. Beggs, Fort Worth	3,168.77	5,494.83
Shaw, Fox & Adams, Burkett	1,495.00	1,678.67
Shaw, Archie, Burkett	6,628.82	8,086.31
San Balt Petroleum Co., Kansas City, Mo.	406.59	306.97
Skinner, E. W., Oil Co., Saratoga	6,191.63	6,791.74
S. & W. Oil Co., Amarillo	19,711.44	16,765.39
Sessions, I. P., Rockdale	414.28	544.49
Standard Oil Land & Leasing Co., Electra	363.50	545.18
Sindorf & Sindorf, Caddo	944.92	1,275.77
Shappell Oil Co., Wichita Falls	48,847.99	73,301.98
Smith, R. E., et al, Houston	20,924.71	27,418.86
Sircovich, A., and Mrs. F. M. Thomas, Houston	565.80	477.16
Speed, C. D., Corsicana	230.96	332.95
Stratton, E. F., Pioneer	355.38	443.63
Schaffner-Wilson, et al, Wichita Falls	1,543.16	2,474.16
Simmons, T. K., Tulsa, Okla.	4,546.00	6,328.85
Southern Exploration Co., Houston	1,077.93	1,332.22
Salado Oil Co., San Antonio	1,845.44	2,018.07
San Creek Oil Co., Amarillo	6,055.61	4,803.93
Strelsky, Joe and Gamble, Rockdale	617.54	855.28
Shoup, C. H., Jr., Colorado Springs, Colo.	4,452.72	6,801.71
Schlicher Oil Co., Beaumont	798.68	978.37
Syndicate Oil Corp., Rochester, N. Y.	3,691.06	5,213.71
Syndicate Oil Corp., Rochester, N. Y. (6-30-28)	2,392.04	3,453.70
Shaw, T. G., trustee, Fort Worth (6-30-28)	117,464.45	145,722.49
Staggers Oil Co., Washington, D. C.	191.66	62.15
Swicegood, F. L., trustee, Eastland	379.12	508.02
Staley, J. A., Wichita Falls (6-30-28)	2,545.16	3,695.64
Smith-Hanlon, Inc., Tulsa, Okla. (6-30-28)	3,200.01	4,183.81
Sullivan, M. J., Kansas City, Mo.	409.51	522.08
Southwest Oil & Development Co., Amarillo	336.10	235.27
Southwest Oil & Development Co., Amarillo	1,732.13	1,299.09
Staggers Oil Co., Washington, D. C.	None	None
Stidham & Thrasher, Electra	450.95	288.65
Sheffield, Frank H., Houston	1,971.04	2,365.25
Sterling Oil & Gas Co., Abilene	156.39	200.18
Stump, E. J., & Harry Hines, Wichita Falls	20,000.38	29,577.26
Scott & Nance, Graham	1,521.54	2,037.12
Scott & Britton, Graham	196.80	266.98
Smith, M. L. V., Vernon	722.28	982.29
Sheldon, W. J., Electra	2,740.61	4,319.51
Swicegood, F. L., trustee, Eastland	681.13	964.58
Saigh, N. A., San Antonio	1,999.94	2,582.47
T		
Tidwell, R. V., trustee, Graham	5,698.96	8,311.86
Teatsorth, L., et al, Eastland	2,579.11	4,236.59
Teatsorth, L., et al, Eastland	308.18	434.53
Terry, H. M., Sour Lake	9,976.93	11,473.47
Tidal Oil Co., trustee for Associated Oil Co., Texas Division, Tulsa, Okla.	7,717.32	8,221.96
Tidal Oil Co., Tulsa, Okla.	260,531.77	211,485.73
Tidal Osage Oil Co., Tulsa, Okla.	8,461.97	9,716.79
Turman, L. C., Fort Worth	94,052.96	59,715.17
Transcontinental Oil Co., Tulsa, Okla.	43,363.53	59,676.98
Transcontinental Oil Co., Tulsa, Okla.	5,719.99	8,187.77
Transcontinental Oil Co., Tulsa, Okla.	1,306,768.99	833,623.50
Thomasson, E. M., & Co., Inc., Denver, Colo.	931.45	1,450.05
Tillman, J. W., Humble	659.61	763.87
Tidwell, R. V., trustee, Graham	421.56	585.28
Tucker Oil Co., Wichita Falls	76,163.27	108,778.13
Thale Oil Co., Beaumont	5,299.02	8,418.68
Thompson, J. E., Humble	503.28	602.91
Triangle Petroleum Co., Inc., Fort Worth	1,142.62	1,690.48
Texas Company, The, Houston	3,991,443.32	4,768,573.70
Tate-Weekley & Tubb, Fort Worth	9,119.64	7,295.71
Timblin, W. E., Wichita Falls	210.20	316.75
Talley & Irick, Shreveport, La.	154.16	201.95
Theis Oil Co., Sour Lake	3,932.95	4,719.53
Terminal Petroleum Co., Dallas	760.50	1,075.54
Trinity Production Co., Wichita Falls	515.32	800.00
Tripplehorn, J. W., & D. R., Fort Worth	2,505.10	3,330.57
Taylor-Sibley Syndicate, Dallas	2,516.32	3,828.36
Texas Consolidated Oil Co., San Francisco, Calif.	15,757.11	23,250.77
Texas Unity Oil Co., Dallas	3,546.18	5,351.76
Texas Pacific Coal & Oil Co., Thurber	76,923.34	110,467.07
Texas Pacific Coal & Oil Co., Thurber	335,770.60	359,080.29
Texon Oil & Land Co. of Texas, Big Lake	377,922.48	226,787.98
Tannehill, L. B., Albany	83,628.00	118,406.78
Texas Petroleum Development Co., Cameron	5,466.76	7,628.34
Thaxton, W. H. (estate), Austin	319.40	450.36

Name and address—	Barrels	Value
Texota Petroleum Co., Electra	470.15	756.95
Two Republics Oil & Gas Co., Laredo	10,566.09	10,566.09
Taylor-Link Oil Co., Houston	39,113.56	24,788.91
Trans-Bay Oil Co., Galveston	90.00	108.00
Travelers Oil Co., Amarillo	23,704.43	25,320.68
Texas Fidelity Oil Corp., Louisville, Ky.	13,195.12	21,409.06
Trimount Petroleum Co., Shreveport, La.	6,067.77	9,990.22
Triangle Oil & Gas Co., Rockdale	1,586.44	2,163.02
Tecl Production Co., Breckenridge	2,983.72	3,972.34
Trinity Townsite Co., Dallas	760.26	1,087.97
Texas Oil Corp., Dallas	157.17	196.46
Tegler, F. E., San Antonio	140.00	140.00
Terminal Petroleum Co., Dallas	795.88	1,066.46
Trippiehorn, D. R., & J. W., Fort Worth	3,818.83	4,887.04
Texas-Electra Co., Newark, Ohio	375.35	570.28
Tucker, W. B., Dallas	1,788.35	2,331.47
Tidwell, R. L., trustee, Graham	2,886.44	3,866.08
Tyson Oil Co., Sour Lake	495.66	594.79
U		
Unice & Carenter, Houston	6,125.00	7,211.57
United Oil & Fuel Co. of Texas, Sour Lake	964.92	1,157.90
United Producers Co., Wichita Falls	2,443.36	3,591.47
Ungren-Frazier-Gibson-Johnson, Putnam	364.50	535.65
Ungren & Frazier, Putnam	297.00	378.93
United Royalties Corp., Wichita Falls	2,886.41	4,539.36
Upham Gas Co. of Texas, Wichita Falls	300.60	370.42
Upland Oil Co., Amarillo	1,973.97	2,609.47
Unity Oil Co., Beaumont	17,696.00	21,227.00
Underwood Drilling Co. (Erwin lease), Wichita Falls	1,654.64	2,250.31
Underwood Drilling Co. (U. C. Ward lease), Wichita Falls	2,173.24	3,042.54
Underwood Drilling Co. (M-C-U Ward lease), Wichita Falls	5,062.20	7,214.15
Union Oil & Mining Co., Tulsa, Okla.	4,246.79	5,775.63
United Oil Corp., Wichita Falls	3,028.39	4,214.12
Union Production Co., Inc., Rockdale	5,171.21	7,220.08
V		
Virginia Oil Association, Fort Worth	3,184.85	4,827.49
Verschoyle, C. H., et al, Electra	1,569.28	2,031.34
Van Cleave Trust, Baltimore, Md.	789.24	1,054.22
Vergate Oil Co., Tulsa, Okla.	7,345.83	10,695.41
Van Womer, F. E., Wichita Falls	1,266.39	1,993.60
Val Verde Oil Co., Del Rio	1,897.00	2,200.76
Vacuum Oil Co., Houston	5,032.05	8,372.29
Valerio, Inc., San Antonio	595.49	651.52
W		
Wallace, J. C. (Emerick lease), Minerva	443.20	317.76
Wentz, L. H., Ponca City, Okla.	27,142.70	38,883.09
White, Alexander S., Tulsa, Okla.	15,141.47	14,299.55
Weiler, H. J., Wichita Falls	319.73	438.04
Wallace, Dr. Charles William, & Hulda B., Wichita Falls	26,626.97	10,374.79
West Production Co., Houston	8,729.39	10,824.44
Williams, Burt, Wichita Falls	740.12	1,023.00
Wood, Benton, Lesh & McCall, Nocona	8,474.78	7,627.30
World Oil Co., Fort Worth	2,417.16	2,078.76
Wahpoo Oil Co., Rockdale	1,571.06	2,220.90
Whitehill Oil Corp., Tulsa, Okla.	7,131.02	10,536.71
Wilson, Lee, et al, Wichita Falls	8,834.76	12,847.98
Wise & Jackson, Sapulpa, Okla.	3,157.37	4,262.68
West, J. F., Cisco	303.24	447.39
Whaley Mineral & Realty Trust, Fort Worth	2,709.23	3,859.06
Westenelt-Noble et al, Oklahoma City, Okla.	3,529.73	5,061.55
Ward Oil Corp., Ardmore, Okla.	4,337.71	3,470.17
Witherspoon Oil Co., San Antonio	23,381.80	32,179.24
Witherspoon Refining Co., San Antonio	10,402.76	12,047.30
Watts Oil Co., Houston	28,441.85	34,278.28
West, Mrs. Bessie M., Houston	2,117.00	2,540.00
Windham & Pilkenton, Burkburnett	2,531.46	3,698.16
Weiler, J. G., et al, Cross Plains	2,208.60	3,167.89
West, J. H., Cisco	5,478.87	7,899.66
Waggoner Refining Co., Inc., Electra	678,058.68	939,741.22
Westheimer & Daube, Ardmore, Okla.	1,415.12	1,866.51
Weaver & Pois, Wichita Falls	2,871.96	4,108.06
Wichita Production Co., Wichita Falls	11,349.31	16,416.08
Wilson-Broach Co., Beaumont	18,553.39	22,264.09
Weldon Oil Co., Saratoga	11,451.14	11,621.90
Wichita Petroleum Co., Tulsa, Okla.	1,644.08	2,297.36
Weister, E. P., Tulsa, Okla.	3,273.99	4,591.12
Warner-Quinlan Co. of Texas, Dallas	324,793.09	206,423.60
Wimmern Oil Corp., Dallas	1,519.57	2,085.37
Webb, J. R., & J. H. Bryant, Corsicana	321.68	321.68
White & Duncan, Wichita Falls	4,740.23	6,949.04
Why Not Oil Co., Mexia	8,968.00	12,801.34
Wilcox, H. F., Oil & Gas Co. of Texas, Tulsa, Okla.	78,313.53	106,200.19
White Eagle Oil & Refining Co., Kansas City, Mo.	72,391.00	73,869.78
Wo-Mac Oil Co., Wichita Falls	2,169.87	3,279.46
Wilson Drilling Co., Wichita Falls	3,275.48	5,106.89
Wilson Drilling Co. (Snedeker), Wichita Falls	184.44	263.47
Wilson Drilling Co. (Comet), Wichita Falls	4,321.16	6,721.78
Wilson Drilling Co. (Rathke lease), Wichita Falls	3,266.58	4,995.24
Wilson Drilling Co. (K.K.C. lease), Wichita Falls	948.57	1,449.10
Woodyn, W. C., Wichita Falls	1,244.12	1,884.41
Wills Oil Co., Rockdale	1,940.76	2,631.14
Williams, J. H., Dallas	5,401.22	7,300.10
Wetzel, Sophie, Oconomowoc, Wis.	7,240.93	6,668.99
Wheelock & Collins, Corsicana	20,927.62	30,783.07
Woodburn Oil Corp., Dallas	5,300.45	7,700.55
Wolfe, A. T., & Son, Wichita Falls	2,921.54	4,214.70
Witcher, W. C., et al, Wichita Falls	394.56	612.10
Witcher, Annie L., guardian, Wichita Falls	2,507.90	4,028.64
Western Oil Corp. of Texas, Wichita Falls	23,667.65	27,479.28
Woods & Bennett, Humble	6,913.55	8,296.27
Wakefield, M. E., et al, Cross Plains	302.64	481.51
Web Oil Co., Humble	4,599.61	5,519.54
Watkins, J. A., Wichita Falls	76.32	104.55
Worth Oil Co., Wichita Falls	150.00	202.50
Weed-Gayle Oil Co., Beaumont	43,057.75	51,669.30
West Texas Land Co. (Julius Jones farm lease), Fort Worth	274.00	344.45
Wear, G. F., et al, Brownwood	205.44	217.76
Wetzel, Sophie, Oconomowoc, Wis.	43,459.22	36,973.26
Woodward & Lee, Houston	14,616.87	16,547.79
Washoma Petroleum Co., Enid, Okla.	1,777.92	2,733.59
Walker, B. S., Breckenridge	1,412.62	1,526.35
Western Oil Sales Corp., Wichita Falls	3,536.12	4,913.77
Wilkins, L. A., Burkburnett	2,317.10	3,359.79
Watson, M. B., Fort Worth	600.00	600.00
Woodley Petroleum Co., Shreveport, La.	11,595.54	19,352.51
Y		
Young Brothers & Alexander, Inc., Fort Worth	16,069.78	25,043.34
Yount-Lee Oil Co., Beaumont	3,237,565.86	3,957,951.95
Z		
Zadie Belle Oil Co., Fort Worth	569.00	836.72
Total	44,550,350.69	$42,564,610.31

KENTUCKY-TENNESSEE

(Continued from Page 40)

parties' No. 5 Nancy Farmer produced 70 bbls. initial.

The Ohio Oil Co.'s No. 18 James C. Ellis farm, in the Ambrose Pool, produced an initial of 75 bbls. Same company's No. 2 W. T. Greer farm, in the Whittaker Pool, was dry at 604 feet.

Ray Bigler and others drilled a dry hole in No. 3 on the M. Roach 22 acres, in the Whittaker Pool, at 585 feet. Lyle and French's No. 3 on the J. W. Whittaker 66 acres, same pool, produced an initial of 30 bbls. In this well a string of 643 feet of casing was set; sand at from 643 to 663 and went to a total depth of 680 feet.

James C. Ellis is credited with a dry hole at his No. 7 on the B. L. Gossett farm, in the eastern part of the Ambrose Pool, being the first failure for this lease, which is among the good leases of Ohio County. No. 6, same farm, is said to show around 50 bbls. initial below the Jett sand which was found dry, and supposed to be the Jones sand which was found in the Jones Pool, southwest of Whitesville, in Daviess County, which puts an entirely new sand to be tested out in the area of the Gossett farm. Mr. Ellis found a dry hole in his second test on the Barney Taylor 50 acres, near Bells Run, northwest of the Ambrose Pool, at a depth of 797 feet.

Cumberland Petroleum Co.'s Nos. 25 and 26 on the Bob Hamilton 276 acres, near the Gossett farm, are estimated at around 50 bbls. each. There are 24 producing wells on the Bob Hamilton farm, and 2 dry holes.

Chester Oil Co.'s test on the Clyde Ford farm, south of the Whittaker Pool, is a 20-bbl. producer. Leeper Oil Co.'s No. 2 Ollie Evans farm, in the Ambrose Pool, is also a 20-bbl. pumper.

J. M. Meredith and others' No. 6 on the Kelley heirs 66 acres, in the Kelley Pool developed a 28-bbl. producer from a total depth of 404 feet. In this well a string of 365 feet of casing was set, and sand from 374 to 394 feet.

Daviess County Wells

Two of the best wells in Daviess County for the week were the Petroleum company's Nos. 4 and 5 on the Everett L. Burns farm, in the Brown Pool, near Utica; No. 4 producing an initial of 90 bbls. and No. 5 for 80 bbls. No. 6 same farm is drilling.

The Ohio Oil Co.'s No. 11 well, 200 feet from the south line and 600 feet from the west line of the Lawrence Roby 87 acres, in the Roby Pool, came in a duster, which was somewhat of a surprise as it looked as though this entire farm was sure for producers.

In the Jones Pool, southwest of Whitesville, McMahan and others' No. 3 on the Frank Fuqua farm, is showing for a 60-bbl. initial producer at 620 feet.

Percy Jolly, of Cleveland, Ohio, drilled a test on the Paul Wethington farm, in Browns Valley, near Utica and got a dry hole. This is the third duster found by Mr. Jolly, in the valley, and he will hunt some other spot to try his luck.

Wittmer Oil & Gas Co. struck a nice gas well at a test on the Bryant farm, in the Red Hill district. In the same pool, Young and Daugherty's second test on the Ambrose Feldpausch farm, is showing for 10 bbls.

L. C. Young and others' No. 3 on the J. L. Parks farm, in the Red Hill district, is reported at 30 bbls. initial. Thompson and others' test on the Asher heirs farm, proved dry in the Jett sand and will be drilled for a deeper pay sand.

Daley and Lowman's No. 1 on the P. F. L. Howard farm, north of the Emmett Burton well and about 11 miles southeast of Owensboro, is reported a dry hole. Roeder and Dresser have a dry hole at a test on the W. W. Brown farm, in the Red Hill area, southwest of the Hayden well.

Eastern Gulf Oil Co.'s No. 3 on the M. C. Ruby farm, in the Red Hill area, is reported showing from 10 to 15 bbls.

Jesse Watts and others' No. 3 on the Lawson Howard farm, in the Jones Pool, southwest of Whitesville, is reported a duster.

Allen County Wells

In the Scottsville Field of Allen County and in the Settle district, the White Plains Oil & Gas Co.'s No. 31 on the T. J. Oliver farm, is a 2-bbl. pumper at 353 feet, with No. 32 drilling. Harley & Coatsworth drilled a dry hole in a test on the Robert Welch 63 acres, same district, at 375 feet.

There is still a vast amount of good drillable territory in old Allen County and the way some of the wells maintain their production is a surprise. The sections around Meador and Pope postoffice are going to get a new play as very few wells have been drilled there. W. K. White and son, of Hollywood, Calif., and an old-time eastern operator, formerly of Bowling Green, Ohio, has a lease on the Meador farm and is drilling No. 1 in the southeast corner of the lease and about 600 feet west of No. 3 on the Douglass farm, which is reported making 100 bbls. a day from a depth of 399 feet and in 30 feet of pay sand. No. 1 on the Douglass farm, just east of No. 3, produced 125 bbls. the first 24 hours and is still making 35 bbls. a day. Bill Christian and "Pop" Carrol, of Bowling Green, Ky., are drilling a well on the Levi Towe farm, southwest of the Meador farm drilling well of W. K. White and son. The White interests have five producing wells and one dry hole on one of the Meador farms, and two wells on another Meador farm, and if the one now drilling develops a well, it will give a great many locations to drill on the three Meador farms. Nos. 1 and 3 on the Douglass farm are both natural producers.

Field Pickups

The Illinois Pipe Line Co. had a barge of oil in transport to Louisville sink in the Ohio River at Rockport a few days ago, the barge being consigned to the Aetna Refining Co. The oil was pumped out the barge, and the barge raised. It was not necessary to pump out all the oil, but the loss, it was estimated by oil people, would be in the neighborhood of $5,000.

Claypool and Botts failed to find a pay sand in the Jett at a test on the Harrison lease, near Deanfield, in Ohio County, and are going down for a lower pay.

SOUTHWEST TEXAS

(Continued from Page 45)

Survey 1,569, Block 3, Reiser gas field, is temporarily abandoned at 1,481 feet.

Bexar County

Marland Oil-Sun Oil Co.'s No. 1 J. B. Stewart, M. Monjarias Survey, at 2,603 feet in Edwards topped 2,586 feet has been abandoned dry.

Duval County

National Oil Co.'s No. 2 Ball, location in Block 5 of Ball Subdivision, has been temporarily abandoned.

NEW LOCATIONS MADE

Bastrop County

Atlantic Oil Producing Co.'s No. 1 Yoast, A. Garcia Survey, 600 feet west of discovery well, is erecting derrick.

Cranfill & Reynolds' No. 3 A. Yoast, A. Garcia Survey, is location 300 feet southwest of No. 1.

The Texas Company's No. 1 A. Yoast, A. Garcia Survey, is location offsetting discovery well on the south.

Amerada Petroleum Corp.'s No. 1 A. Yoast, A. Garcia Survey, is building derrick 600 feet east of discovery well.

Billy Mayfield's No. 2 McColl, Stephen F. Austin Survey, 50 yards from No. 1 West, is drilling at 500 feet.

Bexar County

H. J. Moore's No. 1 Holly R. Ellison, 14 miles west of San Antonio, is ready to spud in.

Caldwell County

Hadley Oil Co.'s No. 4 Merriweather, A. Floyd Survey, Bruner Field, is location 380 feet east of No. 3.

Hadley Oil Co.'s No. 3 Merriweather, A. Floyd Survey, Bruner Field, is location 380 feet east of No. 2.

Hadley Oil Co.'s No. 2 Merriweather, A. Floyd Survey, Bruner Field, is location 380 feet east of No. 1.

Hadley Oil Co.'s No. 1 Merriweather, A. Floyd Survey, Bruner Field, is location 150 feet west of CEL.

Abercrombie Oil Co.'s No. 2 Lida Moses, A. Floyd Survey, Bruner Field, 450 feet to west line and 150 feet to north line, has derrick up and moving in rig.

Golden West Oil Co.'s No. 5 Wilson, A. Floyd Survey, Bruner Field, is location 50 feet southwest of No. 1, special permit secured to drill to Edwards and will case off the Austin producing in No. 1.

Jake Jarmon's No. 1 Floyd Jolly, a wildcat, has been spudded in.

Humble Oil & Refining Co.'s No. 1 Moses and others, A. Floyd Survey, Bruner Field, is location 150 feet to south and west lines.

Humble Oil & Refining Co.'s No. 1 T. B. Johnson, Gerren Hinds Survey, is location in center of tract, also in Bruner Field.

Humble Oil & Refining Co.'s No. 1 W. W. Hickman, Gerren Hinds Survey,

Bruner Field, has derrick up 150 feet to north and east lines.

The Texas Company's No. 3 Merriweather, is location in Bruner Field offsetting Ratcliff's No. 1 Malone.

The Texas Company's No. 4 Merriweather, is location offsetting well of North & South.

M. K. Towns' No. 2 W. W. Hickman, Gerren Hinds Survey, Bruner Field, is location 150 feet to north and west lines.

M. K. Towns' No. 3 W. W. Hickman, A. Floyd Survey, is location 150 feet east of CWL.

M. K. Towns' No. 4 W. W. Hickman, A. Floyd Survey, Bruner Field, is location 150 feet to south and west lines.

Calhoun County

B. F. Thompson's No. 1 H. S. & F. C. Thomas, John P. Tully Survey, 910 varas north and 5 feet 30 inches west of north corner of John C. Post Survey, is drilling at 2,014 feet in hard sandy lime rock.

Live Oak County

J. K. Rowan Drilling Co.'s No. 1 Lyne, Survey 171, is location in south central part.

Jim Hogg County

Alworth-Stevens-Hild Co. is making location for a test in the Alworth Field.

Randado Oil Corp.'s No. 26 Palacious, Survey 291, Block 19, located 575 feet to north line and 1,050 feet to west line, has been spudded in.

Refugio County

Jack Myers' No. 1 St. John, J. Scott Survey, is location 708 feet to northwest lines and 3,074 feet to northeast lines.

Webb County

Edouard Raymond's No. 1 Schmeltzer, Share 2, Brewster Pasture, J. Galan grant, is moving on and is in wildcat acreage.

Serna-Forrest's No. 1 Benavides, Survey 2,272, Block 2, Carolina-Texas Field, an old hole is to be deepened from 2,070 feet.

Sun Oil Co.'s No. 8-A Yeager-Strohman, Share 5, Albercas Field, is drilling at 20 feet, 3,475 feet to north line and 575 feet to west line.

Zapata County

R. V. Hill's No. 4 Ramirez, Survey 627, located 785 feet to northeast lines and 450 feet to northwest lines, is drilling at 400 feet.

Cole Field—Duval County

J. J. O'Hern's No. 1 Benavides, Survey 697, Block 6, located 150 feet to south and east lines, is moving on. O'Hern & Seacord's No. 7 Benavides, Survey 174, Block 11, located 540 feet to southeast lines and 535 feet to northeast lines, is drilling in rock at 93 feet.

Humble-Reiter-Foster Pool

Humble Oil & Refining Co.-Reiter-Foster's No. 10 Kohler, Survey 166, located 165 feet to east line and 1,605 feet to south line, is drilling at 706 feet; No. 11 Kohler, Survey 395, located 1,155 feet to north line and 165 feet to west line, has set 10-inch casing at 229 feet.

Driscoll Gas Field

Robert Driscoll's No. 13 Driscoll, Survey 448, located 2,100 feet to east line and 900 feet to south line, is rigging up.

Schoolfield & O'Byrne Field

Magnolia Petroleum Co.'s No. 2-A Hahl, Survey 51, located 150 feet to east line and south line, is drilling at 2,800 feet; No. 2-B Hahl, Survey 61, located 3,381 feet to east line and 150 feet to south line, is moving on. S. & O. Oil Co.'s (Schoolfield-O'Byrne & Pearson) No. 1 Bowe, Survey 250, Block 11, located 150 feet to north and east lines, has sand at 2,324 feet and set casing. Onyx Oil Co. (Schoolfield-O'Byrne & Pearson) No. 2 Norton (Krauter), Survey 250, Block 19, located 558 feet to east line and 150 feet to south line, in sand at 2,324 feet tested gas and is deepening. The Texas Company's No. 1 Hahl, Survey 250, Block 18, located 150 feet to north and west lines, is drilling at 2,000 feet.

Randado Field—Jim Hogg

Magnolia Petroleum Co.'s No. 41 Merchants State Bank, Survey 155, located 150 feet to north and east lines, is drilling at 1,240 feet. T. J. Conway's No. 1 C. Palacious, Survey 232, Block 6, located 175 feet to north line and east line, is drilling at 1,410 feet. Randado Oil Co.'s (American Well & Prospecting Co.) No. 25 Palacious has been spudded in.

Schott-Mirando Fields—Webb

O. W. Killam's No. 1 Killam, Survey 457, located 1,470 feet to west line and 2,490 feet to north line, has spudded in.

Reiser Field

Marts & Beavins' No. 1 Johnson, Survey 1,617, Block 9, located 500 feet to north line and 100 feet to west line, is drilling at 2,600 feet. R. C. Holsworth's No. 1 Wheatley, Survey 1,569, Block 3, located 847.7 feet to north line and 305.2 feet to east line, is standing at 1,481 feet.

Mid-Ojuelos Pool

Aviator Gas Co.'s No. 1 E. Garcia, Survey 606, Block 11, located 150 feet to south and east lines, at 1,605-10 feet is showing oil and is going on the pump.

Albercas Field

O. W. Killam's No. 27 Bruni, Block 64, located 2,902 feet to south line and 947 feet to west line, is drilling at 2,100 feet; No. 28 Bruni, Block 64, has been spudded in, location to be announced next week. Magnolia Petroleum Co.'s No. 13 Yeager-Strohman, Share 5, located 150 feet to west line and 750 feet to south line, has sand at 2,485 feet which tested dry and is now down 2,500 feet; No. 14 Yeager-Strohman, Share 5, located 900 feet to north line and 575 feet to east line, is location; No. 15 Yeager-Strohman, Share 5, is location 1,400 feet to north line and 575 feet to east line. Houston Oil Co.'s (Rycade) No. 2-A Yeager-Strohman, Share 5, located 381 feet to north line and 2,248 feet to east line, is drilling at 1,950 feet. Rycade Oil Corp.'s No. 4 Yeager-Strohman, Share 5, located 750 feet to north line and 150 feet to east line, has been spudded in.

Aviator Field

G. C. Salley's No. 1 Puig, Carter-Pinkton tract of Puig ranch, 220 feet to west line and 150 feet to south line, is rigged up and standing. Suladie & Mimms' No. 1 Puig, 450 feet to east line and 155 feet to north line of Puig (Kirkpatrick) tract in Albercas grant, is testing sand at 1,848 feet.

Carolina-Texas Pool

C. R. Miller's No. 1 de la Garza (Miller & Daniels) Survey 48, Block 47, located 150 feet to north and east lines, is coring for sand at 1,595 feet.

Magnolia-Cole Field

Cole Petroleum Co.'s No. 65 Benavides, Survey 412, Block 4, located 1,060 feet to west line and 160 feet to north line, is drilling at 2,200 feet. Houston Oil Co.'s No. 4-D Benavides, Survey 753, Block 13, is location 160 feet to south line and 822.5 feet to east line; No. 17-D Benavides, Survey 753, Block 5, is location 160 feet to south and west lines. Magnolia Petroleum Co.'s No. 12 Valdez, Survey 754, Block 16, located 750 feet to south line and 650 feet to west line is testing at 2,319 feet.

Jennings Field—Zapata

South Texas Production Co.'s No. 1 Jennings, Cerrito Blanco grant, 8,890 feet to southwest lines and 8,750 feet to southeast lines, is testing at 1,432 feet. O. W. Killam's No. 5 Cuellar, 1,000 feet to southeast lines and 670 feet to southwest lines of tract, has been spudded in; No. 7 Cuellar, 425 feet to northwest lines and 770 feet to southwest lines of tract, has spudded in.

Cedar Creek Field—Bastrop

Cranfill & Reynolds' No. 2 A. Yoast, A. Garcia Survey No. 2, located 300 feet northeast of No. 1, is rigging up.

Gas Ridge—Bexar

Medio Oil Co.'s No. 9 Cohen, 500 feet southeast of No. 7, is shut down at 470 feet.

Luling Field—Caldwell

M. W. Koening's No. 7 Tiller, John Henry Survey, 300 feet east of No. 6, at 2,108 feet in Edwards will, due to the good core in Austin, test that formation before completing in the Edwards. Magnolia Petroleum Co.'s No. 5-A R. Rios, 450 feet to southwest lines and 150 feet to southeast lines of tract, is drilling at 550 feet.

Joe Bruner Field

Pat Armstrong's No. 1 E. Martin, A. Floyd Survey, 150 feet to northeast lines and 410 feet to southeast lines, at 2,680 feet bailed dry and is drilling deeper. Cranfill & Reynolds' No. 1 W. L. Smith, A. Floyd Survey, is location 150 feet to south and west lines; No. 2 W. L. Smith, same survey, 150 feet north of center of south line, is getting casing at 2,650 feet; No. 3 W. L. Smith, same survey, 150 feet to south and east lines, is drilling at 2,267 feet; No. 1 Merriweather, same survey, 150 feet to northwest and northeast lines, is drilling at 1,250 feet. Date Oil Co.'s (Tackleberry) No. 1 W. W. Hickman, Gerren Hinds Survey, at 2,740 feet is coring and not in Edwards yet. Golden West Oil Co.'s No. 1 Cook, A. Floyd Survey, 480 feet to northeast lines and 170 feet to northwest lines, is in chalk at 2,250 feet; No. 4 Wilson, A. Floyd Survey, 450 feet to northwest lines and 150 feet to northeast lines, is setting casing in the top of the chalk. Gulf Production Co.'s No. 1 J. J. Davis, A. Floyd Survey, 150 feet to northwest and southwest lines, is rigging up. T. C. Hadley's No. 1 Tiller, Gerren Hinds Survey, at 2,928 feet is plugging back to complete in the Austin; No. 2 Wilson, J. Radford Survey, is standing at 2,800 feet. M. S. Holladay's (J. T. Barlow) No. 1 Bouldin is shut down at 3,070 feet. C. E. Lange's No. 1 Kate Colding, A. Floyd Survey, 150 feet to northwest lines and 112 feet to northeast lines, is location. Larson-Walsh's No. 1 Fred Watson, Solomon Seal Survey, 150 feet to northeast and southeast lines, at 2,749 feet shot in the Austin and is cleaning out to deepen to the Edwards.

Lutex Oil, Inc.'s No. 1-A W. F. Davis, A. Floyd Survey, 150 feet to northwest and northeast lines, is in top of chalk at 2,360 feet; No. 3 F. Davis, A. Floyd Survey, 150 feet to northeast and southeast lines, is drilling at 2,625 feet in Eagleford; No. 5 Davis, same survey, is location. Plum Creek Oil Co.'s No. 1 E. L. Mayton, Hector McNeil Survey, in center of survey, is shut down at 240 feet.

H. C. Ratcliff and others' No. 1 Cora Malone, A. Floyd Survey, 150 feet to north and west lines, at 2,735 feet in Edwards topped 2,964 feet is to shoot with 220 quarts in the Austin. Roxana Petroleum Corp.'s No. 1 J. Smith, A. Floyd Survey, 150 feet to north and east lines, has derrick up; No. 1 W. L. Smith, same survey, 150 feet to north and west lines, is rigging up; No. 2 W. L. Smith, same survey, 109 feet to south line and 487 feet to east line, is rigging up.

Sun Oil Co.'s No. 2 Cora Malone, A. Floyd Survey, 300 feet northwest of No. 1 and 150 feet to southwest lines of tract, has set casing at 2,736 feet in Edwards topped 2,730 feet. The Texas Company's No. 1 M. Merriweather is drilling at 1,400 feet (first reported as No. 2), No. 2 M. Merriweather (first reported as No. 1), A. Floyd Survey, 150 feet to southeast lines and about 750 feet to northeast lines, is drilling at 2,214 feet. Turman & Brown's No. 1 City of Luling, A. Floyd Survey, 150 feet to northeast and southeast lines, is drilling at 950 feet. United North & South Development Co.'s No. 1 K. C. Baker, A. Floyd Survey, 150 feet to northeast and southeast lines, is drilling at 2,511 feet with no chalk yet.

Luling Field—Guadalupe

Magnolia Petroleum Co.'s No. 24 L. Marinez, 150 feet to northeast and southeast lines of tract, is location; No. 7 J. M. Roberts, Harriett Cottle Survey, 150 feet to southwest and southeast lines, is drilling at 2,094 feet. A. B. A. Oil Co.'s No. 4 Britton Harris is shut down at 1,250 feet for repairs on boilers.

Kingsville Pool—Kleberg

Humble Oil & Refining Co.'s No. 4 Flato, Section 40, Lot 10, located 250 feet to east line and 450 feet to north line, is bailing at 2,898 feet.

Cartwright Field—Live Oak

Houston Oil Co.'s No. 1-A Brown Land & Cattle Co., M. B. Kivlin grant, is location 325 feet to west line.

Three Rivers Field

W. J. Walton's No. 3 C. H. Wedding, 300 feet west of No. 2, expects to deepen well from 1,578 feet.

Agua Dulce Field—Nueces

Alexander and others' No. 1 J. J. Eliff, Agua Dulce Survey, 600 feet northeast of center of southwest line and 600 feet northeast of SE cor., Section 49, is drilling around 2,100 feet. Davis-Horn and others' No. 1 Thomas Ragland, Manton & Briggs Subdivision, SW cor., Lo 13, has set surface casing at 416 fee R. & G. Corp.'s No. 1 Ed Allen, Ros Peters Subdivision, NW cor., Block 6 Section 6, is standing at 3,006 feet.

Saxet Gas Field

Saxet Gas Co.'s No. 4 Weil, has de rick up and is moving in tools; No. 5 Dunn is location 1,500 feet southwes of No. 1 Dunn.

Refugio Gas Field—Refugio

Benedum & Trees' No. 2 Claude Heard C. Heard Survey, Block 1, located 30 feet west of No. 1, is drilling at 1,73 feet; No. 3 Claude Heard, 300 feet sout of No. 1, is drilling at 1,020 feet. Hous ton Oil Co.'s No. 9 F. B. Rooke, T Mullen Survey, 150 feet to south and ea lines, is drilling at 2,210 feet; No. 1 F. B. Rooke, same survey, about 2,00 feet northwest of discovery oil well, a 3,512 feet cored sand at 3,512 feet show ing oil and will make drill stem test No. 11 F. B. Rooke, same survey, 15 feet to east lines and 350 feet to sout lines, is drilling at 1,980 feet; No. Wilson Heard at 4,992 feet tested sal water and is plugging back to sand a 3,700 feet. Houston Gulf Gas Co.'s No 7 James Agnes Lambert, Refugio town tracts, 750 feet to east line and 2,000 fee to north line, will deepen from 2,70 feet; No. 3 Rea, Block 5, is location William F. Morgan's No. 2 James Agnes Lambert, 250 feet to south line and 37 feet to east line of tract No. 8 of Lambert Subdivision, is moving in rig to deepe from 2,730 feet; No. 1 Leslie Adkins, Lo 4, Block 10, is location 150 feet to nort and east lines. W. L. Pearson's No. Mitchell, 600 feet north of Refugio town lots, 250 feet west of Goliad road, teste salt water and is deepening from 3,57 feet. Pat Rutherford and W. L. Pear son's No. 1 J. M. O'Brien, 1,000 feet t south line of Mrs. Rose Lambert lan and 7,000 feet west of railroad, is stand ing at 4,500 feet dry.

SOUTHWEST WILDCATS

(Continued from Page 45)

Duval County

National Oil Co.'s No. 2 Ball, 300 fe to north and west lines of Block 5 subdivision of Ball ranch, has derrick u

Starr County

The Texas Company's No. 1 Ofel Resendez (H. A. Russell), Porcion 6 Block 174, located 150 feet to south an east lines, is drilling at 1,400 feet.

Webb County

Baku Oil Co.'s No. 1 A. M. Brun Survey 735, Block 7, located 450 feet t north line and 150 feet to the east lin is drilling at 1,700 feet. William Jewell's (T. P. Morgan) No. 1 J. M Gutierrez, Survey 857, Block 8, locate 150 feet to south and west lines, standing at 80 feet. O. W. Killam's N 5 Billings, Survey 713, located 2,65 feet to north line and 2,340 feet to we line (location changed), is drilling 2,450 feet.

Zapata County

National Oil Co.'s No. 1 Don B Adams, center of N half of Section 1 Block 4 of subdivision of Adams tract is moving in machinery.

Atascosa County

Allaun & Cosden's No. 1 Shaw, Wi liam Caruthers Survey No. 366, is loc tion 150 feet south of CNL.

Bastrop County

Gypsy Producing Co.'s No. 1 Lottma estate, east of Bastrop, is shut down 2,146 feet.

Bexar County

Dixie Oil Co.'s No. 1 Medina Irrig tion Co., William Miller Survey No. 18 located 1,666 feet to north line and 4 feet to west line, has spudded in. F. Eckert's No. 2 Dobrowolski, Section Block 52, is location 300 feet north No. 1. Humble Oil & Refining Co No. 1 D. & A. Oppenheimer, 450 fe east of Pleasanton Road and 750 fe to south line of tract, is drilling at 217 feet.

Blanco County

Robert Rodson's No. 1 Glasscock, Su vey 50, located 150 feet to CEL at 1,0 feet, is showing oil, about 80 feet sta ing in the hole.

Caldwell County

Fred Adams' No. 1 Burney, Gide

Pace Survey, is drilling at 1,440 feet. Bartlett Brothers' No. 1 C. N. Martindale, William G. Steffey Survey, 490 feet to northeast lines and 972 feet to northwest lines, is shut down at 1,392 feet. John V. Edwards' No. 1 W. C. Caldwell, Cornelius Crenshaw Survey, 600 feet to south line and 300 feet to east line, is moving in machinery. The Texas Company's No. 1 D. T. Lackey, George W. James Survey, is location 880 feet to southeast lines and 450 feet to southwest lines. Russell-Hill's No. 1 Hill, McCullough Survey, is drilling at 175 feet.

Comal County

George Kruger's No. 1 Uecker, A. Gayteau Survey No. 198, located in SE cor., is drilling at 100 feet.

Colorado County

National Oil Co.'s No. 1 H. T. Brandt, Freeman Pettus League, is location 150 feet to south line and 1,000 feet west of highway.

Dimmitt County

George W. Morgan's No. 3 City National Bank, Section 25, is location 600 feet east of No. 1.

Edwards County

McMan Oil & Gas Co.'s No. 1-B Walter Schriener, H.E.&W.T.R.R. Survey, Section 50, Block F, 330 feet to south and east lines, is drilling at 3,760 feet. Gail Oil Co.'s No. 1 Neal Jergin, S.C.& G.R.R.R. Survey No. 2, located 1,000 feet to north line and 740 feet to east line, is setting casing at approximately 2,000 feet.

Frio County

Pilgrim Oil Co.'s No. 2 Blackaller, James Gouley Survey, is standing at 3,218 feet waiting for rock bit.

Fayette County

Marshall & Moore's No. 1 John A. Kerr, M. Muldoon League No. 5, about 250 varas to north line and little west of the center, is drilling at 1,940 feet. National Oil Co.'s No. 1 J. C. Melcher, S. M. Williams League No. 1, located 300 feet to north and east lines, is rigged up. R. E. Phalon's No. 1 Cervenka, Fayette County School Lands, 450 feet to south line and 150 feet to east line, is drilling at 2,502 feet.

Goliad County

J. E. Alexander's No. 1 Campbell, Goliad Survey, Block 7, located 315 feet to north line and 327 feet to east line, is shut down at 825 feet. W. G. French's No. 1 J. E. Pettus, near Cabeza Creek, has derrick up and is moving in rig. McCarson and others' No. 1 Broyles, Goliad Townsite, is drilling at 400 feet.

Gonzales County

Alexander & Smith's No. 1 Billings, G. Gwinn Survey, is location in northwest corner. Joe Bruner's No. 1 R. D. & J. C. Miller, Richard Heath Survey, 3,040 feet to north line and 200 feet to east line, is shut down for repairs on rig and will resume this week. Dunning & Pierce's No. 1 Mrs. Mattie Keepers, R. Ward Survey, is standing at 203 feet. W. D. Flynn's No. 1 Wilhausen, S. Bateman Survey, east central part of the lease, is drilling at 4,800 feet. W. G. Malone's No. 1 Staton, J. M. Salinas Survey, 375 feet to southwest lines and 1,275 feet to northwest lines, is shut down at 400 feet. George Sullivan's No. 1 Norwood, Winslow Turner Survey No. 3, located 2,080 feet to northeast lines and 2,410 feet to northwest lines, is shut down at 705 feet. The Texas Company's No. 2 Bateman, A. Zumwalt Survey, is drilling at 250 feet; No. 1 M. Thornton, A. Zumwalt Survey, is location 719 feet to northeast lines and 153 feet to northwest lines. L. P. Unkel's No. 1 Lumm & Bouldin, R. Ward Survey, Block 10, located 570 feet to CSL, is shut down at 380 feet.

Guadalupe County

Brodie and others' No. 1 B. B. Dix, Ira Nash Survey, 610 feet to north of road and 320 feet to east line, has derrick up and moving in rig. J. J. Christie's No. 1 Taylor Thomas, Gustavus Chotwell Survey, 1,100 feet to southwest lines and 1,130 feet to southeast lines, is drilling at 923 feet. Magnolia Petroleum Co.'s No. 1 C. H. Adams, J. Randolph Survey, 150 feet to southwest and southeast lines, is erecting derrick. T. H. Poole's No. 1 C. Woehler, John King Survey, 310 feet to north line and 210 feet to east line, is rigged up and standing. Wolf Creek Oil Co.'s No. 1 Mrs. L. Hocke, Harriett Cottle Survey, is location 150 feet to north and west lines of tract.

Hays County

Estess-Moore & King's No. 1 C. N. Sledge, Hunton & Jones Survey, 285 feet to northwest lines of farm, is standing at 804 feet.

Jackson County

J. B. Douglas' No. 1 C. O. Lowrance, John McHenry Survey, 720 varas to northwest lines and 3,700 varas to southwest lines, is shut down at 3,020 feet. The Texas Company's No. 1 W. C. Moore, I.&G.N. Survey No. 209, located 5,108 feet to south line and 150 feet to west line, is drilling at 2,727 feet. Wright Brothers' No. 2 Classen, 1,500 feet north 10 degrees west of No. 1, is at 3,200 feet total depth; No. 7-A Drushel, T. Rodriguez Survey, 900 feet due east of No. 3, is preparing to test at 3,200 feet.

Jim Wells County

Cushing Oil & Gas Co.'s No. 2 M. Perez, La Tinaja de Lara grant, 4,319 feet to west line and 455 feet to north line, is drilling at 2,410 feet.

Karnes County

Frank M. Swacker's No. 1 Butler, 200 feet south 45 degrees east of Earl B. Reynolds' No. 2 Butler, is drilling at 1,570 feet in tough gumbo.

Kinney County

Mardon Oil Co.'s No. 1 Jim Clamp, Survey 346, Section 1,492, located 5,360 feet to west line and 5,675 feet to south line, is deepening from 1,973 feet to the Edwards.

Maverick County

Thomas Johnson's No. 1 Wipff is standing at 900 feet. Ryan Consolidated Petroleum Co.'s No. 2 Indio ranch, A. Rivas Survey No. 7, NE cor., is drilling at 325 feet. Rycade Oil Corp.'s No. 3 Chittim, 175 feet north of No. 1, has derrick up. No. 3 Sullivan, Section 71, Block 7, is drilling at 4,055 feet; No. 2 Chittim, Section 158, Block 7, is fishing at 7,635 feet.

Medina County

California-Medina's No. 1 Rothe, Survey 1,012, is standing at 3,278 feet. Carl G. Cromwell's No. 1 Taylor, Section 135, Block 28, located 210 feet to north line and 155 feet to east line, is shut down at 350 feet. Donaldson Oil Development Co.'s No. 1 Adams, Joseph Hillemeyer Survey No. 25, located 160 feet to east line and 1,227 feet to south line, is location. Holt & Cromwell's No. 1 Mott, Survey 1,267, is location 2,250 feet to east line and 4,182 feet to south line; No. 1 Henry Batot is shut down at 400 feet. Milton & Webster's No. 1 Crabtree is drilling in. North & South Development Co.'s No. 1 Charles Nehr, Survey 441, located 150 feet to south line and 7,479 feet to east line, is in top of Eagleford at 844 feet, log seems to be running a little high. W. R. Painter's No. 1 Muennink, H. Castro Survey No. 367, is standing at 857 feet. W. T. Richardson's No. 1 Tom Beldele, Survey 593, located 150 feet to south line and 1,000 feet to west line, is at 937 feet.

Nueces County

Nueces River Basin Development Co.'s No. 1 F. C. Allen, G. Farrier Survey, 1,596 feet to south line and 474 feet to west line, is drilling at 2,908 feet, sand at 2,717-25 feet tested a little gas.

Refugio County

Dunlap & Wilkinson's No. 1 Rooke, 1 mile north of Arkansas River, 700 feet west of railroad is standing at 2,750 feet. J. M. Davis and Tom Horn's No. 1 Howard, Section 8, located 600 feet to north line and 2,640 feet to east line, is standing at 417 feet after setting surface casing.

Uvalde County

Pure Oil Co.'s No. 1 J. D. Smythe, Survey 687, located 740 feet north and 146 feet east of SE cor. of Survey 20, is 4,810 feet total depth and plans are to shoot at 2,378 feet with 60 quarts.

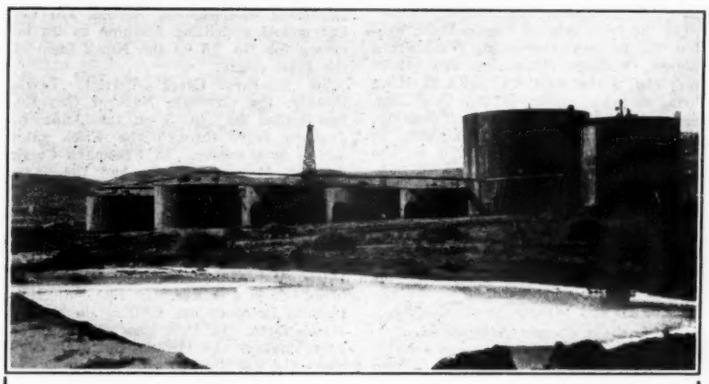
EASTERN FIELDS

(Continued from Page 47)

pumper. In Salem Township, W. C. Patterson completed in the same formation No. 4 on his own farm. It is a duster.

Perry and Knox Counties

In the southwest quarter of Section 29, Hopewell Township, Perry County,



DURABLE MALONEYS AT BORGER, TEXAS

Illustrated above are eight 250-bbl., two 3,000-bbl. MALONEYS erected for the Japhet Production Company on Smith No. 4, at Borger, Texas. Like all MALONEYS, these tanks are assured of maximum life by manufacture of a remarkably durable material, Keystone Copper Steel.

MALONEYS are rendered exceptionally tight by our patented "crimp" seams and joints, packed with our pliable rubber gasketing and dressed with our Gaso cement. Seams are reinforced with rigid steel channels. Our oil heat treated bolts have a tensile strength of 90,000 pounds. Cleaning out plates are large and set flush with bottoms. We use the best valves and thief hatches the market affords.

"Alone in Quality"

MALONEY TANK MFG. COMPANY
Tulsa, Okla., U. S. A.

Distributors at all Principal Petroleum Points

Sizes: 12 to 10,000 Barrels

Packed in Steel-Bound Crates for Export

Howell Aluminum "4-in-1" Vacuum Pressure Valve and Thief Hatch —The BEST and LATEST Deck Equipment—POSITIVE Safety

MADE OF KEYSTONE COPPER STEEL

MALONEY PATENTED BOLTED COPPER-STEEL TANKS

MADE OF KEYSTONE COPPER STEEL

MALONEY ALONE

Nash and others have a duster in the Clinton sand on the Charles Albert farm. In Section 21, Jackson Township, Knox County, the Newark Tool Co. completed a 5-bbl. pumper in the Berea grit on the C. P. Davidson farm.

On the Ohio side on Deans Fork, Section 13, Liberty Township, Washington County, William Huntsman and others completed a test on the Charles M. King farm, a light gasser in the Cow Run sand. In Section 24, Liberty Township, Charles Fickeison & Co. completed in the first Cow Run sand No. 5 on the William F. Schramm farm.

In Section 33, Berne Township, Athens County, I. N. Thomas has a 4-bbl. pumper in the Peeler sand at No. 4 on the E. C. Curtis farm. In Section 23, Marion Township, Morgan County, the Bowman Oil & Gas Co. and the S. & M. Gas Co. are drilling on the Rebecca Mills and Wesley Newton farms.

Meigs County Activity

Meigs County is showing more activity than at any time in the past. In Section 1, Sutton Township, R. C. Tyree and others have a very light pumper on the Lewis Holter farm. The same parties are drilling on the Stanley S. Holter farm. The Davis Oil Co.'s No. 5 on the Giles Hysell farm is a 6-bbl. pumper in the Berea grit. There are 12 wells drilling and 3 rigs up in Meigs County.

In the northwest quarter of Section 11, Sutton Township, Meigs County, Joseph McGee completed in the Berea grit No. 6 on the A. E. Carnahan farm. It is a 10-bbl. pumper. In Section 12, same township, the Preston Oil Co. has a light pumper on the James C. Stobert farm. In Bedford Township, the Logan Gas Co.'s test on the Russell Cuckles farm is a gasser in the Berea grit. In Section 6, same township, the same company has a dry hole on the Albert Horner farm.

Washington County

In Section 19, Liberty Township, Washington County, William Huntsmann and others have a duster on the Wilson Oliver farm. Charles Fickeison & Co. had the same luck on the William F. Schramm farm. In Newport Township, Mendenhall & Co. have a 5-bbl. pumper on the J. Madson farm. In Marietta Township R. N. McBurley & Co. and E. Clark, Jr., are drilling on the John Millison and Ella West farm.

In Section 33, Pleasant Township, Perry County, the Allegheny Oil Co. has a light pumper in the Berea grit at No. 20 on the James McDonald farm. In Independence Township, Washington County, John Crum and others have a 10-bbl. pumper in the salt sand at No. 3 on the Henry Steinhoff farm.

West Virginia

In Grant district, Doddridge County, West Virginia, Trainer Brothers have now drilled their test on the B. P. Crabtree farm through the Big Injun sand. It is a light gasser. In Green district, Wetzel County, the Transcontinental Oil Co. has completed a test on the Charles Schamp farm. It is dry and abandoned.

In Ten Mile district, Harrison County, C. T. Carroll has a Big Injun sand gasser on the Albert Lanhan farm. In Union district, Lincoln County, the United Fuel Gas Co.'s test on the William F. Cooper farm in a gasser in the Berea grit.

In Barboursville district, Cabell County, Dunham & Titus completed a test on the Guyandotte Country Club's property, a gasser in the Berea grit. On McFarlan Creek, Murphy district, Ritchie County, the South Penn Oil Co. has a rig up on the Ritchie Mines tract.

On Tanners Run, DeKalb district, Gilmer County, the McCall Drilling Co. drilled to the Blue Monday sand its second test on the Riddle Brothers' farm. It is good for 5 bbls. a day and was formerly a light pumper from the Maxon sand.

Jackson County

It now looks promising for a little new production in Ravenwood district, Jackson County, one of the counties that has previously had but very little production. The location is a second test of the Heck Oil Co. on the George Kuhl farm. It is 700 feet southwest of the first test and good for 10 bbls. a day in the Berea grit.

In Clay district, Ritchie County, the Consumers Gas & Utility Co. has shot and cleaned out an old well on the Roscoe McCullough farm and increased its production from nothing to 2 bbls. a day. In Grant district, the Schultz Oil Co. has moved a drilling machine to its location for No. 15 on the No. 2 farm of the Ross estate.

In Hackers Creek district, Lewis County, the Carnegie Natural Gas Co. has drilled its No. 5 on the Anna L. Jackson farm through the Fifth sand and it is a gasser. In Freemans Creek district, Moran Brothers had the same luck when they drilled their test on the Kenney heirs' farm through the Big Injun sand.

In Union district, Harrison County, Beren & Beren completed through the Fifth sand No. 6 on the J. D. Helmick farm. It is a duster. In Eagle district, Horner Brothers are drilling on the E. Meton farm. In Paw Paw district, Marion County, the Owens Bottle & Machine Co. has a Fifth sand gasser on the Jacob Fluharty farm.

In Clay district, Monongalia County, the Swastika Oil & Gas Co. has the rig completed for the Titus Lemley farm. In the same district, the Philadelphia Oil Co. has a rig up on the Jesse Headlee farm. In Church district, Wetzel County, the Manufacturers Light & Heat Co. has a gasser in the Keener sand at a second test on the W. C. Hubbard farm.

In McElroy district, Tyler County, the W. P. Baker Oil Co. has a Big Injun sand gasser at a second test on the David Shuman farm. In Grant district, Wetzel County, the South Penn Oil Co. has drilled No. 38 on the H. L. Smith farm to a total depth of 3,000 feet. It is a gasser good for 500,000 feet.

In Clay district, Ritchie County, H. H. Cogwill & Co. have a duster in the Big Injun sand at No. 4 on the J. L. McCullough farm. On Daniels Run, Lee district, Calhoun County, F. F. McIntosh completed a test on the Morgan-Fox farm showing for a 2-bbl. pumper.

In Church district, Wetzel County, the Manufacturers Light & Heat Co. has a Big Injun sand gasser on the Mary Matthews farm. In Center district, the Myers Oil & Gas Co. has a Maxon sand gasser on the George W. Myers farm.

Drilling and Starting Tests

Drilling and starting tests is still an outstanding feature in the eastern fields.

In Union district, Clay County, the Hamilton Gas Co. has started to drill on the B. W. Mullins farm. In advance of developments in McKim district, Pleasants County, Dinsmoor & Co. are drilling on the Ira Eddy farm. In Grant district, Ritchie County, Luther Weaver and others are drilling on the William Layfield farm. In the same district, the Del Rio Oil Co. is drilling on the Caroline Storrs farm. In Murphy district, J. F. Deem & Co. are building the rig for a second test on the A. H. Ayers heirs' farm. In the same district, the Cairo Oil Co. is rigging up on the W. R. Baker farm. The Hope Natural Gas Co. is building a rig on the M. E. Dutty farm. In Clay district, the Hope Construction & Refining Co. has abandoned its test on the Ecaline Lantz farm. In McKim district, Pleasants County, Howard Hall and others have shut down at 1,900 feet on the George Gregg farm.

New Work in Calhoun County

In Center district, Calhoun County, Godfrey L. Cabot has started to drill on the Lester Taylor farm and has the rig completed on the Charles Morris farm. In Lee district, the Dunbar Oil & Gas Co. has a gasser at a second test on the Ellis Laughlin farm.

In Geary district, Roane County, J. L. Storts is rigging up on the I. M. Greathouse farm. In Hackers Creek district, Lewis County, the McCall Drilling Co. is building a rig on the L. I. Bargerhoff farm. In Grant district, Wetzel County, the Carnegie Natural Gas Co. is rigging up on the Lee Glover farm. In Duval district, Lincoln County, the United Fuel Gas Co. has made a location on the Albert Adkins farm. The same company has also made a location on the Lewis heirs' farm.

In Ellsworth district, Tyler County, J. H. Pentz is due in the sand on the David Smith farm. In Grant district, Wetzel County, the West Virginia Consolidated Oil Co. has a rig up on the O. Cahort farm. George Varman is drilling on the James T. Blair farm. In New Milton district, Doddridge County, W. L. Travis is drilling on the W. E. Marmon farm. In Union district, Ritchie County, the Imperial Oil & Gas Co. is due in the sand on the C. V. Iams farm.

In Ravenwood district, Jackson County, the Heck Oil Co. has the rig completed for a test on the John Hartley farm. This location is 1,700 feet southwest of the same company's test on the George Kuhl farm. On McFarlan Creek, Murphy district, Ritchie County, the South Penn Oil Co. has a rig up on the E. Bicherstaff farm.

Southwest Pennsylvania

In Buffalo Township, Butler County, Pennsylvania, in the vicinity of the Harvey farm producers of the Phillips Gas & Oil Co., there is some new work starting. The Phillips Gas & Oil Co. has drilled in its test on the McFarlan farm, in Buffalo Township, and the well flowed 335 bbls. the first 24 hours after the Fifth sand pay had been tapped. The location is 500 feet south of the gusher owned by the same company on the Harvey farm. The Harvey farm well started at 35 bbls. an hour but declined rapidly and at this time is producing about 15 bbls. a day.

One mile southwest of the Harvey well, E. W. and L. Eisler are drilling at 500 feet on the John Voegley farm. In the same township, 2 miles southwest of the Harvey well, Charles J. Heck is down 500 feet on the Edward Porter farm. Some of the wells started soon after the Harvey well came in will be due to get the sand next week.

In Wayne Township, Greene County, E. W. Maple & Co. have a Big Injun sand gasser on the E. W. Maple farm. In Richhill Township the Staggers Oil & Gas Co.'s test on the Peter Staggers farm is a gasser in the same formation.

MUSKEGON FIELDS

(Continued from Page 51)

Development Syndicate; Stanley Daniloff, of the Muskegon Oil Corp.; C. L. Bullock, of the Ottawa Oil Corp.; E. L. Robinson, independent operator; George H. Shoup, of the Shoup Oil & Gas Co.; Joseph Victor, of the Victor Oil & Gas Co.; G. E. Dake, of the Paragon Oil Co.; M. C. Hagan, drilling contractor; David Gudelsky, of the Ma-Ha-Go Syndicate; Ray Steele, of the Wa-Je-Sel Oil Co.; Don G. McAfee, of the McAfee-Refior Syndicate, and Kelley Goldboss, independent operator.

Only two new completions were recorded in the Muskegon Township Field during the week, one the Shoup Oil & Gas Co.'s No. 3 Shoup, NW NW Section 8-10-16, which gauged open flow capacity of 10,000,000 feet a day at 2,045 feet. A string of 5⅞-inch casing will be run to shut off this amount of dry gas and the well will be drilled into the oil pay sands below.

The Diamond Oil & Gas Co.'s No. 1 well on the property of the North Muskegon Development Co., SE NE Section 7-10-16, came in with an initial flow of 200 bbls. of oil from the Dundee formation at 2,067 feet. The well has the smallest gas flow of any successful completion in the Dundee formation.

Two wells were drilling into the upper Traverse formation pay sands: The Central Gas & Oil Co.'s No. 1 Joldersma, NE SW Section 8-10-16, and the Puritan Oil Co.'s No. 1 Nick Overkamp, SE SE Section 7-10-16. A show of oil had been encountered in the Central-Joldersma well at 1,641 feet and oil was expected within a few feet in the Puritan-Overkamp well drilling at 1,658 feet.

A peculiar thing happened to the Muskegon-Ottawa-Davis Oil Companies' No. 1 Reeths well, SW SW Section 4-10-16.

There are 60 rigs in Muskegon Township, 13 in Laketown Township and 9 drilling on wildcats in different parts of Muskegon County.

Laketon Township

The second producer in Laketon Township was brought in, the Reed Oil Co.'s No. 1 L. Young, SE NE Section 11-10-17. It came in at 2,056 feet with an open flow capacity of more than 9,000,000 feet a day of gas and a spray of about 50 bbls. a day of oil. It will be drilled deeper.

One other completion in Laketon Township was dry in the Dundee formation and the third well was abandoned. The duster was the Johnson Oil Refining Co.'s No. 1 Savacool, SW SE Section 2-10-17. Salt water was struck at 2,092 to 2,095 feet. The same company's No. 1 Adams, NW SE Section 9-10-17, will be abandoned at 1,725 feet where drillers had been working on a bad fishing job for two weeks. Formations were running very low.

The Johnson Oil Refining Co. also announced purchase of Carl Prather's No. 1 Thompson well, SW NW Section 12-10-17, and the 120-acre lease on the north end of which the first successful well in Laketon Township was drilled. Consideration for the well and the lease was reported to be $50,000. The well has a gas flow of 5,000,000 feet a day and will make about 50 bbls. of oil.

The Maire-Caswell-Kidder No. 1 Shuler, NW NW Section 12-10-17, a direct north offset, is nearing the casing point above the Dundee formation.

Two other wells are drilling near the upper Traverse pay level in Laketon Township: Buckeye Oil & Gas Co.'s No. 1 VanLoo, NW SW Section 11-10-17, and Bark & Pack's No. 1 A. Fenner, NW SE Section 11-10-17. Four other wells are drilling at less than 1,000 feet. Two are rigging and there are seven announced locations on which no activity has been started.

Muskegon County Wildcats

A showing of oil was encountered in Harper & Newman's No. 1 wildcat on the property of Flora Gordon Cook, NE NE Section 2-9-16, Fruitport Township. This is an old mineral well.

The S. B. Ridenour Syndicate's No. 1 Antisdale, SE SE Section 2-19-16, Norton Township, will be abandoned at 2,250 feet as no signs of oil have been discovered.

The Fink Development Syndicate's No. 1 Nash well, SW NW Section 20-9-14, Ravenna Township, was drilling at between 1,600 and 1,700 feet and expecting to hit the upper Traverse pay sands.

Two other wildcats are drilling: The Muskegon Development Co.'s No. 1 Haas, SE SW Section 29-9-14, Ravenna Township, and the Shifting Sands Oil Syndicate's No. 1 fee, SW NW Section 20-11-15, Cedar Creek Township, a dry test.

The Creek Land Development Co. is moving in a rig for No. 1 Wittels, NE NW Section 34-11-15, Cedar Creek Township.

A rig also was moved in this week by the Sun Oil Co. for No. 1 Grelewicz, SE NE Section 26-11-16, Dalton Township.

A rig was unloaded at Holton, about 20 miles north of Muskegon, and was being moved to the property of Jens Jensen in Section 1 or 2 of Cedar Creek Township. The exact location was not available.

Four Companies Merge

Formation of a combination of four oil and gas companies with a combined capitalization of $500,000 to operate leases on 125,000 acres throughout State of Michigan was announced here today.

The four companies now to be associated are: The Ottawa Oil Corp., of Grand Haven; the Midwest Petroleum Co., also of Grand Haven; the Dutch Oil Co., of Holland, and the Crude Oil Co. of Michigan, of Muskegon. The last of the four has just been capitalized at $250,000 to take over the Michigan interests of the Davis Oil Co. of Ohio. The Ottawa and Dutch companies are capitalized at $100,000 each and the Midwest company, just formed, at $50,000. A fifth unit is to be formed to operate largely in Ottawa County. The objective of the combination is the exploitation of leases on 125,000 acres controlled in Muskegon, Ottawa, Kent, Oceana, Montcalm, Allegan, Midland and Van Buren Counties.

The combination is controlled by Wil-

liam M. Connelly of Spring Lake, president of the Ottawa Oil Corp. and of the Midwest Petroleum Co.; C. L. Bullock, president of the Crude Oil Co. of Michigan and vice president of each of the other four companies, and H. A. Brink, secretary of each of the companies.

Offices are maintained at Grand Haven and Muskegon and a branch office is to be opened at Grand Rapids preparatory to starting drilling operations in Kent and Montcalm Counties.

LA.-ARK. WILDCATS

(Continued from Page 42)

around Arcadia, Gibsland and Bienville. Gas in commercial quantities has been developed in the Bisteneau bottoms whereas nothing beyond a show of either oil or gas has been developed in the northern end of the parish. Stanford's well will be the fourth under way in Bienville at this time, two of the others having been on the books for many months and the third a recent test that is making hole without interruption. The last report on this wildcat, Gray and others' No. 1 Johnson in Section 21-18-6, midway between and 2 miles south of Arcadia and Gibsland, was that it was drilling gas rock at 2,152 feet and was dry on drill stem test not far below that level.

Red River Parish

In Red River Parish Ab Jones' Rock Petroleum Co.'s No. 1 Pierson in Section 12-14-11, has set 6-inch with packer at 1,736 feet and is waiting on standard rig to pump from 9 feet of sand, total depth 1,761 feet. Having bailed 20 bbls. in two hours it looks good for about 50 bbls. on the pump. It is an offset to a good flowing well drilled by Gulf Refining Co. during the early days of Red River exploration in an area that would have been intensively drilled had not Red River in one of its erratic moments flooded the country. Meantime development opened Bull Bayou and the river has changed its channel again and left this old territory open and Jones and associates have it leased up practically solid.

Enochs and others, who shut down No. 1 Curry in Section 39-11-12, Tensas Parish, when it tested 23 feet of broken sand, total depth 3,569 feet, and got a healthy flow of hot salt water, have decided not to abandon but have killed the water flow and are drilling at 3,581 feet. H. C. McDonald's No. 1 United States in Section 18-23-1e, 2 miles south of Carter & Wingfield's No. 2-A Clark, completed this week pumping 20 bbls. of fluid from 2,295 feet, cored a salt water sand at 2,233 feet and shut down. In Section 6-18-13, Lawson district of Union County, Arkansas, Morefield and Tate topped the red beds at 2,912 feet and are drilling at 3,023 feet. Two years ago a half dozen or so gas wells of large volume and heavy pressure were completed in this vicinity and Morefield, operating as Superior Oil Co., and Walber and others got four wells showing for production, all at around 2,600-1,700 feet but the sand was thin and salt water finally took all completions though they were commercial wells for a short while and El Dorado got part of its fuel supply from the Arkansas Fuel Oil Co. (Arkansas Natural Gas Co.) through a tap from the wells to the Monroe-El Dorado main.

Mississippi Operations

Three wells in Mississippi, one an old completion, one in grief and in the throes of refinancing and fishing for the past year and the third a new job, came to the surface during the week. Arkansas Natural Gas Co. has gone back to Natural Gas & Fuel Co.'s No. 1 Rye in Section 22-15-17, Monroe County, the second commercial gas well in the State, and is trying to pull 5 3/16-inch casing set with packer at 2,708 feet to go deeper. This was a 4,000,000-foot gasser at 2,702 feet but developed a leaky casing seat. This was remedied and the hole was shot with 40 quarts and the 5 3/16-inch set with packer which failed to hold and the hole has been standing full of salt water while bubbling gas ever since. Total depth is 2,718 feet. Amory Development Co. has got all the junk out of No. 1 Bourland in Section 2-13-19, and set 8¼-inch at 1,406 feet to go deeper. How deep it will go is not determined, but Arkansas Natural Gas Co. plans a 4,000-foot test, possibly 4,500 feet, and failing there is reported to have three more wells to the 2,500-3,000-foot horizon.

Atlantic Oil Producing Co., which has two large blocks in Washington and Sharkey Counties with The Texas Company and will do the development work on both, has derrick up and is moving in rig to drill No. 1 Houston in Section 30-11-6, Sharkey County. It is understood four wells are to be drilled on the two blocks, possibly six.

Standard Oil Co. of Louisiana has a cable rig up 5 miles south of Decatursville in Decatur County, Tennessee, on the north end of the structure mapped by H. D. Easton, of Shreveport, and blocked up by the Chester County Oil Co. of Henderson, Tenn. This structure, 7 miles long, has been checkerboarded with the Chester County Oil Co. on the north and south ends, about 2,500 acres each, with 5,000 acres in the center held solidly by the Chester County company which has already started its well and is down about 250 feet. That country is not sectionized and check locations are lacking. Semte Oil Co. has derrick up and is moving in to drill on the Jodey Howard farm in Madison County, 9 miles north of Jackson.

Late news from Sabine Parish is that R. L. Gay, who set 8¼-inch at 2,117 feet will drill in on No. 2 Bowman-Hicks, Section 14-7-14, with every prospect of getting a commercial gasser in the Nacatoch, a sand that has been missing in other wells in that part of Sabine. Total depth is 2,131 feet and in trying to get a drill stem test the well heaved a gob of mud over the fourble board every time they broke the drill stem to come out with testing tool and no thorough test was made.

NORTH LOUISIANA

Bienville Parish

W. G. Gray's No. 1 Johnson, Section 21-18-6, is drilling gas rock at 2,152 feet. W. P. Wallace and others have made location 1,675 feet north and 244 feet west SE cor. NW SW, Section 15-16-10, for No. 1 Ashley.

Bossier Parish

Triangle Drilling Co.'s No. 1 Bulkley, Section 9-20-13, is drilling anhydrite at 4,130 feet. Woodley Petroleum Co. cemented 6-inch casing at 2,400 feet on No. 2 Whitehurst, Section 36-16-12.

Caddo Parish

Tidal Oil Co. drilled 105 feet on No. 1 McCrary, Section 23-19-16, and shut down again at 1,530 feet.

Claiborne Parish

Dixie Oil Co. found the top of the anhydrite (Trinity) at 3,009 feet and is drilling at 4,050 feet on No. 1 Gilbert in Section 27-21-5. El Dorado Chief Oil Co. is drilling shale at 2,180 feet on No. 1 Baker, Section 26-20-7.

DeSoto Parish

Benedum & Trees Oil Co.'s No. 1 State, Section 22-14-12, is drilling at 2,415 feet. Case and others' No. 1 Boatright, Section 3-10-13, set 10-inch casing at 103 feet. Rudeseale and others' No. 2 Nabors, Section 6-12-11, set 10-inch at 45 feet and 6⅝-inch at 1,120 feet. Thorn Oil Co. made location for No. 1 Burford in the SE NW, Section 22-14-14. Warren & Carruthers' No. 1 Ramsey in Section 33-13-16, shut down at 1,455 feet October 31, has resumed drilling and is down 1,840 feet.

East Carroll

Palmer Corp.'s No. 1 Carroll Land Co. in Section 21-19-11, is in sand rock at 2,891 feet.

Monroe District

Ouachita Parish—Ouachita Natural Gas Co. is drilling No. 2-B D'Arbonne, Section 25-19-2e, at 2,795 feet.

Union Parish—Carter & Wingfield set 6⅝-inch casing at 2,253 feet on No. 3 Hudson, Section 7-23-1e; No. 3 Security Trust, Section 23-23-1e, is drilling at 2,927 feet. H. C. McDonald cored salt water sand at 2,233 feet on No. 1 United States, Section 18-23-1e, and shut down.

Red River Parish

Rock Petroleum Co. set 6-inch with packer at 1,736 feet on No. 1 Pierson to test 9 feet of sand, total depth 1,761 feet.

Richland Parish

Richland Operating Co. cemented 6-inch at 2,283 feet on No. 1 Traylor, Section 24-16-6.

Sabine Parish

W. G. Doern's No. 1 Pickering, Section 17-4-11, is shut down at 4,400 feet. R. L. Gay cemented 8-inch at 2,117 feet on No. 2 Bowman-Hicks, Section 14-7-14, total depth 2,139 feet.

Tensas Parish

Enochs and others' No. 1 Curry, Section 39-11-12, is drilling at 3,581 feet after a salt water test at 3,569 feet.

ARKANSAS

Ashley County

Atlantic Oil Producing Co.'s No. 1 Moffatt, Section 28-16-8, is running core barrel at 3,760 feet. Marcum and others' No. 1 DeYampert, Section 5-19-4, is drilling at 2,100 feet.

Chicot County

Crawford and others' No. 1 Cashion, Section 14-18-2, is drilling at 2,236 feet. S. D. Hunter is drilling No. 1 Sawyer, Section 19-18-2, at 3,321 feet.

Miller County

Martin, trustee, has rig up to drill No. 4 Dale in Section 23-15-26.

Union County

El Dorado—Calgo Oil Co.'s No. 1 Primm, Section 25-18-15, is drilling at 3,343 feet. J. P. Hawkins' No. 1 Goodwin, Section 6-17-15, set 10-inch casing at 160 feet. Starks and others are drilling at 2,500 feet on No. 1 Powell, Section 35-18-15.

Lisbon—Imperial Oil & Gas Products Co. is drilling No. 1 Goodwin, Section 26-17-16, at 2,808 feet.

Lawson—Morefield & Tate's No. 1 Smith, Section 6-18-13, topped the red beds at 2,912 feet and is drilling a dry sand at 3,023 feet.

EAST TEXAS

Shelby County—Chapparall Oil Co.'s No. 2 Holt in the Matthew Moore Survey, is drilling at 1,900 feet.

MISSISSIPPI

Monroe County—Amory Development Co. has set 8¼-inch casing at 1,406 feet on No. 1 Bourland, Section 2-13-19. Arkansas Natural Gas Corp. is pulling 5 3/16-inch casing set with packer at 2,709 feet on No. 1 Rye, Section 22-15-17, to go deeper.

GULF COAST FIELDS

(Continued from Page 47)

has been delayed by a fishing job this time with the sidetracked hole down 4,004 feet.

Hardin County Domes

Paraffin Oil Co.'s No. 79 Paraffine, Batson, tested salt water at 1,096 feet and is standing. East Batson Oil Co.'s No. 16 Stateland has started drilling for another shallow test. At Sour Lake, Lakeview Oil Co. has started drilling in No. 57 fee, a shallow hole.

Rio Bravo Oil Co.'s No. 28 "T" has found another sand showing some oil and will test at 2,092 feet.

Pierce Junction—Harris County

Gulf Production Co.'s No. 26 Taylor, east flank of Pierce Junction, is drilling sidetracked hole at 3,992 feet. This company's No 7 Cain is drilling at 946 feet. Navarro Oil Co.'s No. 3-A Cain is drilling gumbo at 1,810 feet.

On the northwest and west sides of the same Rio Bravo Oil Co.'s No. 9 fee is drilling sticky shale at 5,593 feet. This company's No. 10-B Settegast is in sandy shale at 3,425 feet and No. 11-A Settegast is in hard sand at 3,961 feet. Shaw-Texas Exploration Co.'s No. 2-D Fitzsimmons is being rigged up. Moody Corp.'s No. 3-B Whitehead is drilling shale below 4,277 feet. This company's No. 1-A Whitehead was abandoned during the week after bailing salt water from a sand at 5,419 feet. Moody's No. 4-B Settegast, wildcat on the south side, is drilling lime rock at 986 feet.

Goose Creek—Harris County

Humble Oil & Refining Co.'s No. 74 Simms Smith, northeast of the field, is drilling sticky shale at 5,272 feet. This company's No. 6 Hughes is drilling at 2,024 feet. A rig is up to work over No. 10 Jones Stateland. Gulf Production Co.'s No. 17-A Tabb is drilling at 3,018 feet. Its No. 12 Stateland Producers is being rigged up to pump. Jim McMurry's No. 3 Grace Addey is drilling at 2,675 feet.

Spindletop—Jefferson County

L. A. Painter's No. 3 Rush on the west edge is drilling shale at 4,710 feet. This operator's No. 1 Gordon, also west edge, tested salt water at 3,365 feet and is to be deepened. No. 2 Gordon is drilling sand at 2,976 feet. Unity Petroleum Co.'s No. 11 Gladys City tested salt water at 875 feet and is sidetracking at 700 feet. Yount Lee Oil Co.'s No. 16 Gladys City is drilling shale and lime at 5,858 feet. Its No. 40 Gladys City is in sand at 5,557 feet. No. 70 Gladys City is in shale and lime at 4,510 feet and No. 71 Gladys City is drilling rock at 5,025 feet.

On its McFaddin lease, Yount Lee Oil Co.'s No. 10 is drilling shale and lime at 2,770 feet. No. 31 was put on the pump at 5,098 feet and made water with some oil. No. 56 is drilling lime at 4,739 feet. No. 85 is in sand at 2,803 feet; No. 86 is in sand at 2,273 feet, and No. 87 is in gumbo at 2,312 feet.

This company's No. 12 fee is swabbing to test sand at 4,109 feet. No. 1 Davis is in sand at 4,272 feet.

Hull—Liberty County

Republic Production Co.'s No. 106 Dolbear, an old well deepened, drilled into salt and has been abandoned at 3,077 feet. This company's No. 102 Dolbear, another old well worked over, was bailing at 2,180 feet at the close of the week. The Texas Company's No. 5 Hannah fee, which tested salt water at 3,607 feet, still is trying to clean out hole to deepen. Humble Oil & Refining Co.'s No. 24 Guedry is rigging up. Its No. 18 Guedry, an old well, was abandoned during the week at 2,986 feet. Gulf Production Co.'s No. 23 Phoenix is drilling deeper at 3,149 feet. Its No 50 Phoenix is drilling below 3,268 feet. Its No. 19 Scarborough is drilling at 1,354 feet.

Orange—Orange County

Humble Oil & Refining Co.'s No. 12 Winfree is drilling deeper at 4,621 feet. Sun Oil Co.'s No. 6 Brown is in shale at 5,625 feet and No 4 Gunstream is still fishing at 3,965 feet. Supreme Oil Co.'s No. 1 Jackson is trying to sidetrack to deepen.

High Island—Galveston County

Marrs McLean's No. 11 Cade is in sand at 3,438 feet. No. 12 is drilling shale and lime at 4,155 feet. Gulf Production Co.'s No. 8 Smith is drilling at 1,005 feet.

Raccoon Bend—Austin County

Humble Oil & Refining Co-Valley Oil Corp.'s No. 2 Urban continued to blow wild Saturday. A derrick has been skidded over the gasser which will be used in further attempts to kill the well. No. 3 Urban, which is located as close as possible to the wild gasser is drilling below 200 feet and will be rushed to the gas sand tapped by the No. 2 Urban in attempt to relieve the pressure in the No. 2. No. 1-B Grawunder is drilling shale at 3,238 feet. No. 1-C A. Grawunder is standing with surface casing cemented at 1,336 feet. No. 1-B Bracey is drilling shale and lime at 2,456 feet. No. 2 Walton is in hard shale and lime at 1,172 feet. No. 1 Beal is drilling sandy shale at 2,403 feet, and No. 1 hard shale and lime at 927 feet.

DeWalt—Fort Bend County

Humble Oil & Refining Co.'s No. 4 Sugarland is drilling sand rock at 1,297 feet. No. 1 Deatherage is drilling sandy shale at 3,751 feet. No. 1 Drew is drilling hard sand at 2,603 feet and No. 1 Nelson is in sandy shale and lime at 2,631 feet.

South Louisiana

Lockport—Calcasieu Parish

Vacuum Oil Co.-Gulf Refining Co.'s No. 3 Miller is drilling sandy shale at 4,567 feet. No. 21 Miller is in gumbo at 4,051 feet. Derricks are up for Nos. 22 and 23 Miller. No. 4-A Farquahar tested salt water at 4,435 feet and will be deepened. No. 1 Henshaw-Lemoin is drilling sandy shale showing some oil at 3,786 feet.

Jennings—Acadia Parish

Cranfill & Reynolds' No. 1 Donnelly is drilling at 3,608 feet. Gulf Refining Co.'s No. 2 Leckelt is drilling rock at 4,600 feet. Jennings Petroleum Co.'s

No. 2 Eunice Crowley is drilling at 1,316 feet, and Port City Oil Co.'s No. 10 Haywood at 1,583 feet. E. F. Simms' No. 1 Syndicate-Clemont is preparing to sidetrack and drill back to the sand at 3,872 feet. No. 2 Clemont is drilling shale at 3,665 feet. This operator's No. 1 Jennings is drilling gumbo at 3,578 feet and his No. 1 Grace Vonschuler is down 3,847 feet.

On the east side, The Texas Company is spudding in on its No. 4 Rayne Heirs. Yount Lee Oil Co.'s No. 3 Crowley is drilling sand and shale at 4,423 feet. This company's No. 6 Housierre-Latrielle is ready to spud.

Edgerly—Calcasieu Parish

Drysdale & Savoy's No. 4 Hill is drilling at 1,000 feet with 10-inch surface casing set at 615 feet. Green Oil Co.'s No. 9 Moore tested salt water at 2-910 feet and will be deepened. Rex Petroleum Co.'s No. 1 Narroni is drilling below 4,426 feet. This company's No. 3 Hunter was abandoned at 3,045 feet.

Vinton—Calcasieu Parish

Vinton Petroleum Co.'s No. 2 Gordon tested salt water at 3,473 feet and has been abandoned. Marrs McLean has rigged up to deepen his No. 11 Gray, a former small producer. Salt Dome Oil Co.'s No. 1 Shaw is down 1,981 feet. The Texas Company's No. 18 Vincent is drilling at 1,956 feet. Vinton Petroleum Co.'s No. 8 Rescue is drilling at 2,857 feet. A rig also is up to work over its No. 15 Rescue.

Hackberry—Cameron Parish

Calcasieu Oil Co.'s No. 4 Valery found the salt but Saturday had not been abandoned, is drilling in salt at 3,760 feet. This company's No. 12 Watkins is drilling rock at 3,657 feet. This company has made location for No. 1 Breaux. The latter is in Section 46-12-9w at the mouth of Kelso Bayou adjoining Calcasieu Lake, in which Louisiana Land & Exploration Co. completed a good well two weeks ago and which is still flowing around 1,800 bbls. daily. Cameron Oil Co.'s No. 2 Duhon is standing with 6⅝-inch casing cemented at 3,142 feet. It will test a sand showing oil at a total depth of 3,151 feet. Rycade Oil Corp.'s No. 1 Gulf Land is fishing a lost bit. Bottom of hole is 2,588 feet. Yount Lee Oil Co.'s No. 22 State Land is drilling hard sand at 3,297 feet. Its No. 8 School Land is drilling sandy shale at 3,474 feet. Shallow Oil Co.'s No. 1 Lacey tested salt water during the week and was abandoned at 1,725 feet.

Bayou Bouillon—St. Martin Parish

Rycade Oil Corp. has three tests on the sand. These are No. 3 Atchafalaya with 9-inch casing cemented at 3,957 feet; No. 4 Bouillon fee, which is setting casing at 3,346 feet and No. 5 Bouillon fee, whose total depth is 3,331 feet. No. 4 Atchafalaya fee tested salt water at 3,268 feet and is drilling deeper in sandy shale at 3,443 feet.

Miscellaneous Fields

Sinclair Oil & Gas Co.'s No. 5 Norton, Damon Mound, is drilling sand and boulders at 1,646 feet. Gulf Production Co.'s No. 17 Moore, Orchard, tested salt water at 4,191 feet. Fort Bend Oil Co.'s No. 1 Moore has set 6⅝-inch casing to test sandy shale at 2,867 feet. Gulf's No. 11 Moore, an old hole being deepened, is drilling below 3,900 feet. At Humble, The Texas Company's No. 24 Koehler is drilling gumbo, lime and boulders at 2-127 feet. This company also has made location for No. 22 House.

Yount Lee Oil Co.'s No. 3 Louisiana Petroleum Co., Anse La Butte, St. Martin Parish, La., is standing with casing cemented at 2,678 feet. It will test at that depth. Gulf Refining Co.'s No. 12 Lutcher-Moore, Starks, is fishing drill stem at 3,843 feet. No. 12 Industrial, Starks, is testing at 3,947 feet. Pure Oil Co.'s No. 6 Yount Lee Oil Co., Sweet Lake, is drilling sandy shale and shell at 6,141 feet. No. 7 is rigging up.

MISCELLANEOUS WILDCATS

Austin County—Gulf Production Co.'s No. 1 Jackson, San Felipe Dome, is coring cap rock at 3,250 feet. In Waller County on the same dome, Dixie Oil Co.'s No. 1 Brazos in the river still is shut down at 400 feet because of high water.

Brazoria County—Shell Petroleum Corp.'s No. 3 Reece, Allen Dome, is drilling hard shale at 2,201 feet. No. 5 Allen is in sandy lime at 3,805 feet. Empire Gas & Fuel Co.'s No. 1 Brock, Stratton Ridge, is drilling cap rock at 1,915 feet. Meyers and associates' No. 1 Davidson, Clemens Dome, is standing in sandy shale at 619 feet.

Chambers County—Pure Oil Co.'s No. 2 Lost River, Lost Lake Dome, is drilling sand and lime at 3,310 feet.

Colorado County—Alexander & Smith have abandoned their No. 1 Kinkler, C. Amsler Survey, in shale at 3,805 feet. Humble Oil & Refining Co.'s No. 1 Brenton, east of Altair, is drilling sand at 222 feet. The Texas Company's No. 1 Hoyo, Eagle Lake, is drilling gumbo at 1,060 feet. Others in the county are standing.

Fort Bend County—Gulf Production Co.'s No. 12 Wolf, Long Point, has been abandoned in cap rock at 762 feet. No. 13 Wolf has been spudded in. South Texas Petroleum Co.'s No. 1 Hartfield, Needville, is drilling gumbo and lime at 3,342 feet.

Galveston County—Long and associates' No. 1 Irwine & Bishop, 2 miles south of Dickinson, is drilling sand at 3,700 feet. Republic Production Co.'s No. 1 Lobit, north of Dickinson, is drilling shale and lime at 2,708 feet.

Harris County—Humble Oil & Refining Co.'s No. 1 Minnetex at Mykawa, is drilling sticky shale at 4,424 feet. This company's No. 5 Warren at Hockley remains a location. Cedar Bayou Oil Co.'s No. 1 Johnson, 2 miles northwest of Barbers Hill, is washing at 4,240 feet. Others in the county are shut down.

Jackson County—The Texas Company's No. 1 Moore, Edna, showed salt water in a drill stem test at 2,735 feet and is drilling deeper in sandstone at 2,746 feet. Others in the county are unchanged over previous reports.

Jefferson County—Gulf Production Co.'s No. 2 Burrell, Fannette, is drilling at 4,510 feet. It has been coring sand and shale. The Texas Company's No. 1 Pipkin, Big Hill, is drilling gumbo at 574 feet. Westbury Syndicate's No. 1 West, northeast of Westbury, is drilling gumbo at 1,342 feet. River Oil Corp.'s No. 1 Ship Channel is drilling around 1,100 feet. Gaddy Oil Co.'s No. 1 Jones is drilling sand and shale at 2,190 feet. Deep Test Oil Co.'s No. 1 McFaddin is drilling at 2,857 feet.

Liberty County—Humble Oil & Refining Co.'s No. 3 Sterling, Moss Bluff, tested salt water at 2,743 feet and is being drilled deeper. The Texas Company's No. 1 Davis, Davis Hill, is drilling shale and lime at 4,242 feet. Union Exploration Co.'s No. 1 Esperson, Angus McNeel Survey, has been spudded in. Sun Oil Co.'s No. 1 Kovalick, North Dayton wildcat, is drilling below 1,500 feet.

Matagorda County—Crossland and associates' No. 1 Hawkins, first test at Shepherds Mott since the geophysical checking of that dome, is drilling at 608 feet with surface casing set at 500 feet.

Walker County—Davis and associates have abandoned their No. 1 Gibbs, Charles Stewart Survey. It was dry in black shale at 3,534 feet.

Washington County—Sun Oil Co.'s No. 1 Marcus, Gay Hill, is drilling sand with no show at 1,702 feet. No. 1 Einman is drilling sand with no show at 1,602 feet. Both of these tests are considerably deeper than the two producers so far completed on that dome. No. 1 Grote, the discovery well, is drilling deeper from the sand at 1,154 feet. No. 2 Grote, a producer at 1,393 feet, still is shut in for storage.

SOUTH LOUISIANA

Ascension Parish—Triumph Oil Corp.'s No. 2 Lacey is shut down after spudding in pending the laying of a water line. Burnside Oil Co.'s No. 1 Robert set 10-inch surface casing at 783 feet.

Cameron Parish — Shell Petroleum Corp.'s No. 5 Watkins, Black Bayou, is standing waiting cement to set to test sandy shale at 1,240 feet. A derrick is up for No. 6 Watkins.

Iberia Parish—Louisiana Land & Exploration Co.'s No. 2 Averys Island is drilling sticky shale at 5,858 feet. This company's No. 3-A Vermillion Bay at Vermillion Bay Dome, is waiting surface casing cement to set at 957 feet.

Iberville Parish — Shell Petroleum Corp.'s No. 3 Wilbert, Whitecastle, has completed a derrick. Standard Oil Co.'s No. 1 Schwing, Bayou Blue, is down 4,120 feet.

Ohio Oil Co.'s No. 3 Martin, Hager Dome, St. Martin Parish, is drilling sand, shale and gypsum at 3,830 feet. West Pearl Oil Co.'s No. 1 Fritsche, St. Tammany Parish, is drilling gumbo at 1,696 feet. Kentwood Oil Co.'s No. 1 Kent, Tangiphohoa Parish, is standing at 1,571 feet in an oil showing sand. Tanli Oil Co.'s No. 2 Weinberger, same parish, has 8-inch casing cemented in gumbo at 2,485 feet. Southern Gas Co.'s No. 1 Peoples, Terrebonne Parish, is drilling rock at 2,284 feet.

CANADIAN FIELDS

(Continued from Page 52)

addition to those working for other Imperial subsidiaries. "We are not selecting any locations until we are ready to drill," Mr. McQueen explained, "for we might have to alter our plans in view of developments of other wells." A number of offset considerations would be important factors in the company's choice of sites.

As soon as several wells being drilled in the neighborhood of Royalite's No. 22 have been completed to the production level in the Dakota formation, the experiment of storing gas in the Dakota sand will be started. Then the company can observe the results to neighboring wells. The only independent that might be affected by this gas lift system is New McDougall-Segur Oil Co.'s No. 1. The chief purpose of Royalite's No. 22 is to conserve the waste gas from the deep lime, but its influence on producers in the vicinity will form an important part in the experiment.

Dalhousie Organization

Mr. McQueen stated that the permanent organization of Dalhousie Oil Co. will take place very shortly; the Royalite Oil Co. considering its contract with Dalhousie had been completed with the bringing in of three producers, Dalhousie's Nos. 1, 5 and 6. In return for its outlay, Royalite Oil Co. gets 51 per cent of the Dalhousie stock, at present held by a trustee.

J. H. McLeod, western production manager of Imperial, Oil, Ltd., has announced that alterations being made to the Royalite scrubbing plant in the Turner Valley have doubled its capacity, which means that 50,000,000 feet a day will be available for delivery to the Canadian Western Natural Gas, Light, Heat & Power Co. of Calgary. This increased capacity is due entirely to improved methods and equipment.

Foothills Oil & Gas Co.'s No. 1, SW Section 26-20-3w5, is reported to have blown in at below 5,915 feet with a light crude production. The well caught fire immediately afterward, destroying the derrick; the fire is now being got under control.

In the south end of the field, Home Oil Co.'s No. 1, LSD 10, Section 20-19-2w5, is drilling at 5,137 feet, after striking a fair gas flow, estimated 1,000,000 feet a day, in the deep lime at 5,108 feet.

Royalite Oil Co.'s No. 8, LSD 15, Section 12-20-3w5, is at 3,753 feet, and working on drill pipe. Royalite's No. 12, LSD 3, Section 13-20-3w5, is making a bailing test at 2,878 feet. Royalite's No. 13, LSD 6, Section 13-20-3w5, is drilling at 4,334 feet; No. 14, LSD 4, Section 7-20-2w5, is fishing for a lost bit at 3,248 feet; No. 16, LSD 2, Section 12-20-3w5, is standing cemented at 3,610 feet; No. 17, LSD 13, Section 6-20-2w5, is drilling at 3,616 feet; No. 19, LSD 15, Section 12-20-3w5, at 3,076 feet; No. 19, LSD 5, Section 6-20-2w5, at 2,740 feet; No. 20, LSD 7, Section 12-20-3w5, is drilling at 1,675 feet.

Vulcan Oils' No. 1, LSD 11, Section 13-20-3w5, has installed the diamond drill outfit from Spooner's No. 1, and has started to clean out and deepen the hole, which is frozen at the production horizon, 5,004 feet.

In the Jumping Pound district west of Calgary, Imperial Oils' Bow River No. 2, LSD 11, Section 31-24-4w5, is reported spudding in. The location is about 2 miles from Imperial's Bow River No. 1 in LSD 15, Section 12-25-5w5, abandoned last year at 5,585 feet.

Morley Reserve

On the Morley Indian Reserve, Wabash Oils' No. 1 test which got the deep lime at 1,483 feet, has pulled the diamond drill rods from a depth of 1,991 feet. At this depth, 508 feet in the limestone, cores indicated a porous horizon and wet gas was blowing continuously, though not in exceedingly large quantities. Conditions are generally similar to those in the Turner Valley when drilling in the limestone just above the big production horizon.

In the Moose Mountain district, Signal Hill Oil Co.'s No. 2, LSD 9, Section 34-23-5w5, has straightened over 100 feet of hole, and at 1,900 feet is within 75 feet of the bottom.

Irma-Wainwright

In the Irma-Wainwright Field, Wainwell Oils, Ltd., is making steady progress with its two tests.

Hargal Oils' No. 1, LSD 13, Section 2-45-7w4, has a derrick up fairly close to Wainwright. Fabyan Petroleums' No. 1, LSD 8, Section 24-45-8w4, which was cemented on top of the oil sand at 1,840 feet, is being drilled in.

In the Skiff Field, southern Alberta, Imperial-Devenish's No. 3 is rigging up with combination rotary and standard outfit, and will spud in before December 1.

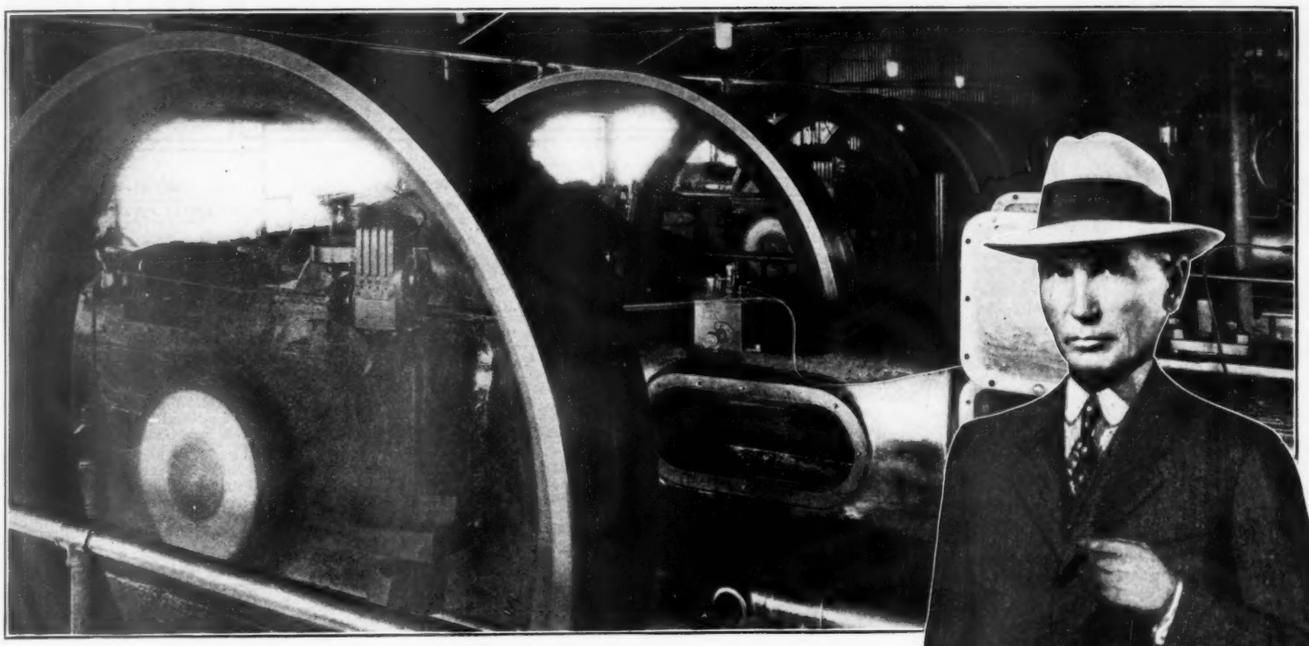
East of Coutts, Range Oil & Gas Co.'s No. 2, LSD 6, Section 21-1-11w4, is reported shut down for the winter at 900 feet. On the Beaver Dome, Madison Oils, LSD 10, Section 24-2-11w4, has cemented 10-inch casing at 665 feet, to shut off water coming from the 190-foot level. Two gas horizons have been encountered, at 525 and 628 feet, with an aggregate production around 1,000,000 feet a day.

Westmount Oils, Ltd., has been incorporated under Dominion charter with office at Edmonton, Alberta, to develop acreage in Alberta and Montana. Officers include: President, Frank McLear, Edmonton; vice president, Thomas Hawkins, Edmonton; directors, William Hanson, Roland Sladden, Edmonton; George W. Hotson, A. Price, J. A. McDonald, Lacombe; W. N. Potter, Stettler; J. E. Smyth, Lougheed. The company holds 80 acres in the Kevin-Sunburst Field and 40 acres in the Viking Field east of Edmonton, and is securing additional Alberta acreage.

In northeastern Saskatchewan, a Toronto syndicate has staked 25,000 acres at the foot of Porcupine Mountain, about 22 miles from Hudson's Bay Junction on the new Hudson's Bay railroad. The territory concerned is forest reserve, and efforts are being made to secure its transfer to the department of lands to facilitate oil development. The Porcupine Field is southeast of the Junction; 16 miles by a wagon trail. Shale deposits are known to exist in the Porcupine area and samples of shale have been sent to Ottawa for analysis, while geologists and engineers have been in the field this fall examining the structures and investigating the oil prospects. A difficulty is that thousands of acres in the Porcupine Forest Reserve are under jurisdiction of the forestry department, and must be transferred to the land department before drilling can be started or even oil leases filed at the nearest land office at Prince Albert, Saskatchewan. It is understood some eight years ago a shallow test started in adjacent territory, but was abandoned before it went deep enough to secure definite results.

Ontario

In Ontario, indications of oil and gas are reported from Allisonville, in Prince Edward County. Oil seepages are claimed, and it is also reported considerable gas was struck in a shallow water well. It is generally considered commercial production is improbable, as the surface of Prince Edward County is occupied entirely by Trenton limestone underlying glacial drift, and most of the original Trenton production must have escaped for lack of suitable cover. The department of mines at Toronto is sending a geologist to investigate.



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1 Keg ⅞x1¾″ New Round Head, 23 lbs.
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200 H. P. Bessemer Gas Engine No. 26,536.
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WE BUY, or Refinance Gas, Oil or Pipe Line Companies with assets of One Million Dollars, or more. Address: P. J. Minck, Tulsa, Okla. Phone 4-0245.

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WRITE for our list; oil leases, royalties and blocks; Pontotoc, Seminole and adjoining counties. Bowles & Smith, Ada, Okla.

FOR SALE — Leases, Oil Production, Asphalt, Limestone and Other Mineral Lands W. P. Harley, Bowling Green, Ky.

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$3 TO $5 per acre for West Texas land with Oil and Mineral rights 40 acres up. New Mexico oil leases. Winter garden lots and truck farms on easy terms; agents wanted. A. Poe, 829 Wilson Bldg., Dallas, Texas.

MICHIGAN LEASES
FOR SALE 2,000 acres leases in Ingram County, Mich. Price $1.00 per acre. Also block leases in new Ohio shallow gas field. J. H. Harmon, 14 Massa Ave., Mansfield, Ohio.

LEASES—PRODUCTION

LEA COUNTY, NEW MEXICO
Perpetual Royalties.
W. S. Patterson,
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FOR LEASE—880 acres. 10 year contract 50 cents rental. Township 11 South, Range 37 East, Lea County, New Mexico. Well going down within four miles. Will sell 1/2 of 1/8 royalty on 1,000 acres, or more. Address, J. R. Webb, Portales, New Mexico.

HAVE 5,000 ACRES in south part of DeWitt County, Texas, this 5,000 acres adjoins The Texas Company block, also the Roxana Petroleum Corporation's block in Dewitt County. This 5,000-acre block is all new 10-year leases, and carry a $1 per acre rental each year. I will sell a few 50 to 100-acre tracts out of the 5,000 acres for $3 per acre. This part of DeWitt County is now getting a big play by all major companies. Now is the time to get protection for South Texas commercial leases and drilling contracts around the two blocks. Address P. L. Tindle, Goliad, Texas.

Owner will lease 2,000 acres solid body Colorado Co., Texas, active territory, (See The Oil and Gas Journal, November 1, page 51) for 2,000-foot test or ten thousand cash, one eighth royalty. Texas University Bulletin 2,333 page 149 says most promising district in county. Almost surrounded by leases to large companies. Box 961, Houston, Tex.

UNITED STATES GEOLOGICAL SURVEY STRUCTURE!
LEONARD CELESTE MONOCLINE RECOMMENDED BY DR. ROBT. T. HILL, GENE R. SMITH, LOYD WILLIAM STEPHENSON AND MANY OTHER NOTED GEOLOGISTS! WELL BEING STARTED IMMEDIATELY IN NEW HIGH GRAVITY OIL DISTRICT OF TEXAS.

The best geological advice in the United States is being followed on the new test of the IMPERATOR OIL CORPORATION on the Leonard-Celeste Monocline—which we believe to be the last untested major structure mapped by the Geological Survey in Northeast Texas.

A 3,000-foot test has been contracted for with one of the best known firms of drilling contractors in Texas. A well drilled in 1921 with rotary tools near our location had 25 feet of saturated sand carrying plenty of oil and gas. A big oil or gas well, possibly both, seems certain. No casing was ever set in the old well, so a test could not be made. This well is not a so-called mystery well—or one that had the "Farmers Sand."

Excellent geology forms the background together with irrefutable evidence of favorable sand conditions. Nine months' work and many thousands of dollars have just been spent getting these leases in shape. All leases have been taken under the supervision of a well known firm of attorneys of Dallas, Texas.

For leases around well at reasonable prices or interest in drilling block, write or wire the Imperator Oil Corporation, 3rd floor Petroleum Bldg., Fort Worth, Texas.

NO STOCK FOR SALE.

FORTY ACRES in the oil belt Mason County, Michigan, in fee $25.00 an acre. Joel Bailey, 417 Cleveland Life Bldg., Evansville, Ind.

PARTIALLY developed gas field, 11 wells holding 9 leases, 700 acres, 4 miles welded pipe line. Easy drilling, two offset oil wells, 100 feet deeper not prospected on this property. Capable much expansion. Address Owners, Box 1214, Wichita Falls, Texas.

ATTENTION, brokers and investors: Write for our list of oil leases and oil royalties in Pontotoc, Seminole and adjoining counties. Bowles and Smith, First National Bank Bldg., Ada, Okla. Phone LD35.

LEASES—PRODUCTION

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Furnace Oils Feature Chicago Market

Fair Spot Demand for Gasoline. Refiners Holding Price. Inquiries for Fuel Oil and Better Tone Reported

By J. B. Waldo

CHICAGO, Nov. 26.—Continued cool weather brought many orders for furnace oils Monday. The largest demand was for distillates, on which some refiners are behind on shipments, making the present market strong. Distillates desirable in every way were held for 3½ cents with the lower gravities or less suitable products selling down to 3¼ cents. Zero gas oils were also ordered quite freely, and the market was firm at full quoted prices. High gravity, low sulphur zero fuel oils were also ordered in considerable quantities for domestic burner fuel.

There was a fair demand for U. S. Motor gasoline from spot buyers, several marketers showing a good number of cars sold, but the spot business with the larger refiners was light.

Inquiries for Fuel Oil

As the close of the month approaches there are more inquiries from the larger users of the industrial grades of fuel oil. Quite a number of such inquiries were received in the market this morning from both local and out-of-town buyers. There was little new developed, but the prices were at least as strong, and the freezing weather gives a better tone to this market, and with the prospect of some increase in the consumption, the situation was regarded hopefully by refiners and sellers generally.

The larger refiners who are still holding to 9¼ cents as their price for U. S. Motor gasoline state that they expect this price to hold to spot buyers, claiming that any reduction in price simply resulted in still lower quotations being made by the refiners who are selling at less today. Their contracts are being taken according to schedule, and this gives them a good volume of business. They do not like to see their spot customers buying elsewhere, but they say they are not going to meet West Texas prices, and might as well hold their present market as make a reduction. Country jobbers were seeking lowest prices for good material and could buy U. S. Motor gasoline, full specifications, at 8¾ cents. Gasoline was freely offered at less than this price, but most of it was West Texas material. The higher tests are being called for to some extent, but even on these quotations are made for material from West Texas at attractive prices. Some of the smaller near-by plants were also quoting prices that attracted some business from buyers who were not too particular as to the origin of the material.

Kerosene continued to drag along with little or no change in either demand or quotations, but the tone was easy.

Gallonage Satisfactory

Jobbers in attendance on the convention said their gallonage was generally satisfactory for the season. Profits were less favorable. We are, taking the territory as a whole, having just about an average season in weather. The total gallonage, according to the major companies which cover practically all the territory, is ahead of last year, at least with them and their sales probably truly indicate the actual gasoline business.

The chief movement on gasoline is still on contracts as expected with so many dealers securing supplies under such agreements. But there are still a good many in the territory who still prefer to buy in the spot market and the number has been somewhat increased during the past two months by the refusal of dealers to accept the new contracts. Some dealers who stood out for a renewal of their old contract with its more liberal guarantee have finally signed with their old source of supply while others have changed to some other refiner claiming that by so doing they had secured a more liberal contract. This may be so in some cases but in several instances exchange of information between refiners has proven that the contract signed was practically the same as offered by the former source of supply. The reasons are obvious. After all, when there is just so much consumption, sales efforts merely result in an exchange of customers. This is just as true of the distributor as of the refiner but the sales effort must be made to prevent the competitor from taking customers away from the usual distributor or refiner and the seller who lacks in his sales effort, whatever form it may take, will surely lose business to his more active competitors.

Spot Market Active

The result of the shifting of contracts or the return to the spot market of those who formerly had contracts has been some increase in the spot buying and the spot market was quite active last week, the orders being numerous rather than large in quantity. Buyers were keenly interested in prices and did a lot of shopping around. Usually there was little demand for rush shipments, although the interruption to traffic by the floods around Kansas City delayed the receipt of cars and gave the traffic departments an opportunity to show their ability in rerouting cars and getting them promptly to their destination. Stocks in jobbers' storage are not large but as a rule they have sufficient supplies for immediate needs and only ask for average prompt deliveries.

The large refiners held their price through the week at 9¼ cents but this was only their own market as the spot market was easy and sagged off until U. S. Motor gasoline was freely offered at resale at 8½ cents. This was for Oklahoma gasoline and was guaranteed to be strictly up to specifications for the U. S. Motor grade. A considerable quantity of 56-58 437 was offered and sold at 8¼ cents which it was claimed would pass both doctor and corrosion tests and differed from the U. S. Motor gasoline only in gravity which it is claimed is immaterial. The same product is offered from West Texas as low as 7⅞ cents for resale.

New Station Price Scale

There were no new developments in the differential territories to the east of this city. Competition continues very keen and prices show no improvement. The new station price scale in the Standard of Ohio and of New Jersey are explained to make a reduction in the margin previously allowed the dealers. That the reduction is made at the time the purchase is made simplifies the plan and makes it attractive to the smallest distributors. A very common prediction is that these new plans will ultimately prevail in the other territories. The demand for the higher gravities is increasing slowly and as the offers are not so liberal prices are steady. Natural gasoline has moved slowly here and prices show little change although somewhat easier. The antiknock gasolines are in good demand and the sale is increasing, some of the increase at least being at the expense of the higher gravities.

Kerosene Drags

Kerosene has dragged along with little change. Refiners report selling at their regular price, around 6 cents, and see no advantage to be gained in reducing their price. There is only a small domestic demand and in this market there is no inquiry from exporters.

The colder weather stimulated the demand for furnace oils particularly distillates, the consumption of which shows a good increase over last year. There has been a brisk movement to the country and a good local consumption, several of the distributors reporting they had all the business their trucks could readily handle. The number of installations has been materially increased during the past summer and fall and a large part have been of the smaller type which can operate satisfactorily only on a distillate. Good distributors keep a record of the make of each installation and supply the proper fuel. One of the short addresses at the recent Marketing Congress was on the building up of a furnace oil business and the distributor who has made a remarkably successful record in doing this advocated the selling of the domestic burner as well as supplying the fuel. He stated that during the summer they sold and installed 150 burners and in each case secured as a part of the sale a contract to supply the oil for the year following the installation. To secure a continuing business they also agree to service the burner without charge so long as they have the contract for supplying the oil used. The speaker stated that the average consumption per burner with their accounts was 3,000 gallons of oil annually. To supply the fuel for the 150 burners will result in the sale of 450,000 gallons of oil which was an appreciable increase in the business of any distributor. He stated there was no more trouble than with the other branches of their business and it gave employment to their selling organization the year round, selling equipment in the summer and in the fall and winter, finding occupation in the servicing and supplying of fuel. This distributor advised oil men to get into the furnace oil business and go in big, not merely with the idea of handling furnace oil because some of the customers wanted them to do so. The price of the 38-40 distillates is now 3½ cents for desirable material. Some is to be had for less but in most cases it is off grade in some way and should be bought from reliable sources who will sell it for what it is and guarantee delivery of what is bought.

Gas Oils Slow

Ordinary gas oils have just dragged along. The zero oils suitable for furnace oils are stronger and there is an excellent demand for the amber grade with a low flash at close to 3 cents. The straw gas oil is scarce and is being held for higher prices by some refiners who can produce it. Local distributors and the country dealers have ordered furnace oil grades freely. The demand includes gas oils in the various gravities with a low flash and cold test and the higher gravities of fuel oils such as the 28-30 and the 30-32. There has been a particularly heavy demand for the 28-30 zero with a low flash and zero cold test. Some sellers have made prices for this grade at $1 to $1.05 a barrel and have done some business. Some gas oils and distillates, for that matter, are offered at slightly lower prices but are usually off in some respect, quite frequently a bad odor. The industrial gas oils including the straightrun and some cracked gas oil are moving along in a routine way. Gas companies are buying at 2⅜ to 2½ cents and the low price is occasionally shaded a little but not so much as before the colder weather set in. Some gas oil has sold at 2¼ cents but it did not have U.G.I. qualities and was used for firing or possibly for blending with heavier fuel oils.

Fuel Oil More Active

There was considerably more activity in fuel oils last week, some additional business being due to the colder weather. Buyers did not fall over one another to place orders but there was really more buying and business could be had by going after it strongly. The best position was taken and held by the higher gravities but there were larger inquiries for the heavy fuels. The buyers are now insisting on having low cold tests and these are at a premium in the better grades. The bulk of the heavy fuels offered have always a fairly low cold test and some a test below zero normally. Railroads bought some oil, the Rock Island being a buyer here. Industries were generally supplied over November but there were quite a number, mostly buyers of small quantities at a time that needed fuel. Aside from the higher gravities in the zero oils there was no change in prices.

Lubs Unchanged

Lubricating oils show no change. The rule is for hand-to-mouth business but there are some compounders who say their business is really better than they anticipated. There is a better demand for the high grade motor oils than for those less well known. Specialists in industrial lubs are doing a good business as the manufacturing plants are all at least fairly busy.

Service Station Cutting

There is a good deal of cutting of the service station prices in many parts of the territory. The worst spot judging from the number of points where the station price has been reduced by the major companies to meet local competition, is in Indiana but there are some reductions in every state in the Standard Oil of Indiana territory. At these points, the procedure has been to reduce the station price without reducing the tank wagon price. At few points where the cut was made has the normal price been restored. In some cases the service station price has been reduced first to the same level with the tank wagon price and then further declined until there are several points where the station price is 1 cent lower than the tank wagon price. Some jobbers have the fixed idea that the number of points where the station price is the same as the tank wagon price will gradually increase until they outnumber those at which the station price has not been reduced and then the entire scale will be revamped so there will be but the one price and the dealers will have a single price subject to the Q.D.A., which they believe will finally be fixed at 3 cents for any quantity. This would be along the line of the recently established scale in the Standard Oil of New Jersey territory.

The major companies scout this idea and assert there is nothing further from their thoughts but the jobbers remain convinced such a plan is considered. They also claim they can adjust themselves to the new conditions and possibly do as well if not better than under the present arrangement. Many oil jobbers have recently expressed themselves as greatly offended at the action of the refiners in cutting their marginal contracts without a more extended notice. These jobbers claim in substance that the increased margins granted to the jobber some years ago were given to him by the refiner to help that jobber increase his outlet of the refiner's gasoline and other products. They claim they were told to go out and get the business for the refiner just as the marketer was given a price which permitted him to resell at a profit to enable him to dispose of the refiner's material. These contracts or agreements were so common and had continued so long that these jobbers feel they were entitled to some more con-

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Lubricants Stronger in Eastern Area

Prices on Steam Refined Cylinder and Bright Stocks Higher, Due to Brisk Demand. No Important Changes in Other Products

By Special Correspondent

NEW YORK, Nov. 26.—Changes of outstanding importance in the East Coast refinery situation have been lacking this week. Gasoline has just held its own and kerosene has been in about the same position. Lubricating oils have staged another upward movement, with the remainder of the refined products group unchanged.

Seasonal falling off in spot market operations has developed, but the advent of this lull in trading has not been accompanied by any pronounced tendency to cut prices to speed up sales. This condition is in marked contrast to the past few years, when refiners were only too willing to grant concessions to increase gallonage, and illustrates the progress which the industry has made in the East Coast area toward stabilization.

Refiners' sales organizations have been busy during the past several weeks in getting their contract business for next year on the books. Substantial sales volume for next year is assured by the contracts already written. In a few instances, buyers who normally cover by contract a year ahead have shown some tendency to cut down their takings on this form of sales agreement, and depend upon the spot market to supply them with the balance of their requirements as they arise. This tendency is obviously due to the weakness which the market has experienced during recent years and bred of the opinion that prices for refined products may go into a slump during 1929 unless the flood of new crude production is stemmed. Large buyers in most instances, however, have shown a desire to get their expected requirements covered by contract, to assure themselves of a regular supply during the year and enable them to plan their budgets for the year with some degree of accuracy.

No startling changes in operating plans for 1929 are under consideration by the large refiners in the East Coast area. It is expected, of course, that cracking facilities will be used to a greater extent, and possibly added to, to secure maximum gasoline returns and to hold down the production of fuel oil as much as possible. Refiners will be forced to make some changes in their cracking equipment to take care of the peculiar properties of the South American and West Texas oil which is now forming so large a part of the East Coast crude supply, but this presents no difficult problems.

Considerable interest is being shown by marketers in this area in the forthcoming convention of the American Petroleum Institute in Chicago. The various sectional committees which have been working on the problem of a code of ethics for the industry will report at this meeting, and it is expected that by the start of the new year the industry will have a definite guide for its marketing operations.

Tank Wagon Gasoline

Gasoline prices have been lowered in several sections of the New England territory during the past week. The changes were irregular, tank wagon and service station prices being reduced at some points, and only the service station basis changed at others. These readjustments are in line with the lower wholesale market and the seasonal slackening of consumption in the cities affected.

Whether the New England revisions presage a general lowering of the tank wagon and service station schedules throughout New York and New England is as yet uncertain. The tank car market is now three-quarters cent per gallon over the peak price of the year, on which the present tank wagon quotation is based, and it is thought in some quarters that another quarter or half-cent decline in the open market at East Coast terminals will affect tank wagon quotations.

Refiners have shown a growing tendency during recent months to pass on lower prices to consumers as quickly as possible, and this policy will doubtless be continued. Thus, while distributors' costs are not being generally lowered, consumers are given quick benefits of lower wholesale markets. This has had the effect of restoring a more nearly normal margin on gasoline sales, and has reduced the unequitable spread formerly prevailing between tank wagon and service station prices. It appears likely that in the future 3 cents a gallon will represent the maximum margin to retail gasoline distributors, with but a 2-cent margin prevailing in some instances.

Demand for gasoline in New York City and surrounding territory has been affected less by the cold weather than holds true of the remainder of the territory. In many of the small communities making up the New York and New England marketing territory, the first snow is often the signal for laying up the car for the winter. In the large cities, however, there is more of a tendency to keep automobiles in service the year around, and thus while the heavy consumption which accompanies pleasure motoring in summer is lost, there is nevertheless a large and well-sustained demand for gasoline to fuel automobiles which are used daily in business.

Tank Car Gasoline

Some uncertainty appears to exist as to the permanency of the present 11-cent tank car basis, although all of the large factors in the East Coast area are reported maintaining the market at that level. Reports from marketers' salesmen indicate that gasoline in tank car lots has been offered the distributing trade at from 10¾ to 10⅞ cents per gallon, but the larger factors are not meeting this competition as yet, and it is evident that such underselling is not much of a factor so far.

Marketers report that there is a growing tendency on the part of jobbers to get their purchases down to a day-to-day basis, however, and this offers eloquent testimony as to the amount of confidence which the jobbers place in the present price basis. Refiners stress the fact that most of the weakness in Group 3 market, which seems to be the barometer by which the East Coast market is often judged, has been in gravities under U. S. Motor, and that the higher tests have advanced on heavy export buying.

California U. S. Motor gasoline is meeting with an active call, the elimination of the quarter-cent differential on this quality having stimulated the demand. Distribution of this type fuel gives the jobber an added sales feature, in that he can offer it to his trade as high-compression motor gasoline at no extra cost.

Premium Fuels

Marketers have noted an appreciable improvement in the movement of premium motor fuels since the arrival of cold weather. Motorists have formed a habit of switching over to high-compression, quick-starting gasolines for winter driving, and advertising on the part of the large refiners has helped "sell" the motoring public on the idea of using such fuel during the cold-weather months.

Some of the company-owned stations in the better residential districts of the metropolitan area are reported to be running as high as 50-50 on their sales of ordinary motor gasoline and the premium fuels. Many of the refiners are using California U. S. Motor gasoline as the base for their premium fuels. All of these fuels have their individual color, which seems to "register" as much with the consumer as the actual brand name of the product. The premium fuel is generally sold at the pump at 3 cents per gallon over the quotation posted for the ordinary quality motor fuel.

Kerosene

Demand for kerosene has eased off a little this week, but the falling off in sales has not yet affected the price basis. Refiners are still quoting water white at 9 cents a gallon in tank car lots at East Coast refineries. Stocks available for prompt shipment are a little more liberal, but so long as the present situation continues, refiners do not look for any material change in the market position. Selling competition is not taking the form of price cutting, and offerings of kerosene from outside markets are not heavy.

The tank wagon market holds steady at 15 cents a gallon. Refiners have developed a substantial volume of kerosene business through their filling stations, and sales through this channel are accounting for an increasing proportion of the marketers' tank wagon kerosene outlet in this territory. Reports from marketers operating farther north in New England territory note an excellent consuming demand for kerosene, this being attributed to the wide use of kerosene for home-heating purposes in the rural communities.

Fuel Oil

A steady demand for bunker "C" fuel oil is reported, and the market remains held at $1.05 per barrel, bulk, at refinery terminals. The large steamship companies are drawing stocks in substantial volume.

Domestic fuel oil consumption continues to run into large totals. Industrial demand is at a high rate, the low price of the oil in comparison with coal having stimulated consumption of the former to a material extent.

Large quantities of fuel oil are also moving into consumption as furnace oil, and the advent of the season's first consistent spell of cold weather has stimulated demand from this quarter. Refiners operating in the East Coast area, it is intimated, are making a determined effort to hold down their fuel oil output, in an effort to get away from the overproduction which has created a record surplus of fuel oil stocks at Atlantic Coast refineries and put the market in an uneconomic position. The current spot quotation for bunker "C" oil is 30 cents a barrel under that in effect at the start of the year, and with the low-priced Shipping Board contracts going into effect January 1 next, the spot market is none too secure at the $1.05 level.

Lubs

The market has continued on the upward move this week, and spot quotations are little better than nominal. Pennsylvania refiners have advanced their quotations several times during the week, and the market shows signs of going higher.

The carload market at Bayonne is quoted at 24 cents a gallon on 600 steam refined cylinder stocks, with 635 quoted at 25 cents a gallon and 650 steam refined firm at 27 cents a gallon. Quotations for 600 Pennsylvania flash lubs are firm at 30 cents a gallon, with 630 flash quoted at 37 cents. Warren E 600 is higher at 27 cents a gallon, with Oil City E firm at 26 cents. Bright stocks have shared in the upward movement, dark 140-150 holding at 41 cents and light 140-150 at 43 cents a gallon.

Domestic buyers have been in the market for stocks in larger volume this week, and it is evident that considerable business which had been held back in expectation of a lower price basis has been released by the current advance. Domestic buyers in many instances had permitted their reserve holdings of lubs to run below the safety margin, and are now in a scramble to fill their depleted stocks.

Export buying has been an important factor in the market situation this week. Operators with strong British connections have been liberal buyers, and in addition large quantities have been booked for shipment to the Continent. South American operators have also been extending the market for more buying support.

There was no change in the market situation on red and pale oils this week. Refiners reported a moderate amount of buying, with small-lot trading the outstanding feature. Prices were well maintained at recently advanced levels, however. Export buyers are in position to pick up these oils for shipment out of the Gulf at prices under those prevailing in East Coast markets.

Petrolatum

Firmness in white grades continues a market feature. Snow white is strongly held at 8½ cents a pound, with lily white 1 cent cheaper, and cream available at 6½ cents a pound. Sellers report continued heavy buying by the pharmaceutical trade. While this class of consumer normally books heavily in the fall months for winter requirements, there has been considerable repeat business this year, and the market is expected to continue active over the balance of the year.

Inquiry for the lower grades of petrolatum has not kept pace with that for the higher qualities, but with refiners showing firm price views on the entire line, quotations on the lower qualities have held steady. Refiners are not offering forward positions in any quantity, most of the current business being on prompt and nearby.

Diesel Oil

The market holds at $2 per barrel, bulk, at refinery terminals, and a continued good movement is recorded. Refiners have lined up most of the big transatlantic business for next year, and are now going after the domestic contracts.

Current reports indicate that a substantial volume of business has already been written for 1929, and it is evident thus early that volume on Diesel oil in East Coast territory next year will run materially in excess of that for the current year. Domestic expansion, however, is expected to suffer some because of the wide disparity in the prices of Diesel oil and bunker "C" fuel oil, in favor of the latter. This conditions, however, has not been reflected in the marine sales end of the business.

Paraffin

Europe has been inquiring for wax again this week, and export buying has kept the market in steady position on most grades. An inquiry for 400 tons for Europe was reported during the week, with two or three of 200 and 300-ton lots. Spot stocks of 120-122 a.m.p. were fairly liberal, and this melting point was off three-eighths at 5¾ cents per pound. Other grades were firm and unchanged.

Export Markets

The feature in export trading this week was the reported purchase by the French subsidiary of a prominent American company of 20,000 tons of gasoline and kerosene. The purchase, it is understood, was made direct from the parent company, and involved three cargoes—one of navy gasoline, one of water white kerosene, and the third of 64-66 390 endpoint naphtha. Aside from this, the export market was rather uneventful throughout the week.

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Automotive Fuels and Lubricants

Research Constantly Changing Viewpoints as to Desirable Specifications. Many Mistaken Ideas as to Importance of Tests

By B. E. Sibley*
Chief Engineer, Continental Oil Co.

With the rapid growth of the internal combustion engine for automotive purposes, gasoline, which had been a troublesome product to dispose of, became a major product, the demand of which was equal to or greater than the supply over short periods of time. This caused the refiner to cut deeper into the crude to secure greater gasoline yield, and as that continued it resulted in changes in the fuel itself, causing change of design in engines and carburetion in order to balance the whole situation.

In 1911 we had 315 bbls. of crude in production per motor car; in 1921, 47 barrels per car, and now approximately 40 bbls. of crude oil per year per car. From these figures it is obvious that both the automotive engineer and the refiners have had some real problems to solve and their success is a tribute to American genius. The public demand for "performance" combined with economy in operation has really resulted in some far-reaching changes in our motor-car engines compared with what they were under our earlier conditions. Along about 1912 the situation showed indications of becoming somewhat strained. Fortunately for the motor-car industry, as well as the oil industry, it was then that the "cracking process" was taken recognition of. This improved method of refining enabled the demand to be satisfied.

The "cracking process" ushered in a decided change for the refiner with the result that today the majority of our gasoline is made by one of the various "cracking processes." In combination with the preceding, the auto manufacturer was reducing the compression ratio of their engines; however, the advent of the "cracking process" momentarily halted that backward movement.

Any engineer who has had contact with these problems knows that to secure the desired fuel efficiency it is necessary to have as much expansion as possible during the power stroke within economical, mechanical limits. This is commonly expressed as "compression ratio," although the correct expression is "expansion ratio." However, owing to the generally accepted expression, we will refer to this as "compression ratio" in further remarks.

Compression Ratio

The manufacturer in his desire to secure as much power and fuel efficiency as possible has always striven to keep the compression ratio as high as possible consistent with other details of design of the particular engine involved. In 1922 the average compression ratio of our motors was 4¼ to 1. The commendable policy of using as high-compression ratio as possible in engine designed, combined with the national economic situation involved, resulted in extensive engineering research work for the purpose of developing a solution to the problem whereby we could use higher compression ratio engines that would be more economical in fuel, more powerful, although smaller, than previous engines. It is common knowledge that the upper limit in compression was already in use, and the "knocking" of engines, aside from being annoying, was of detriment to the motor.

As the result of this engineering research work, two sources of relief were discovered. Ricardo, an English engineer, found that by certain changes of design affecting the shape of the combustion chamber, somewhat higher compressions could be used. Engineering experiments show that this permits the compression ratio to be raised .3 of 1 point. Certainly a move upward, but hardly sufficient to meet the problem according to the result demanded. Some automotive manufacturers today are using the Ricardo head design in their engines with beneficial results.

Use of Chemicals

In this country it was found that by the addition of small amounts of certain chemicals to the gasoline, the desired result was secured. Of the thousands of chemicals tested, only one was found which was practical to use, and that one has the greatest effect of any discovered to date. As you know, that chemical was lead tetraethyl, one of the constituents of ethyl fluid. To go into combustion problems, and the functioning of ethyl fluid in gasoline, would in itself require a rather lengthy paper on that one subject. It has proved the merit engineers claim for it. Since the type of fuel using ethyl fluid has become generally obtainable, one can see the resulting effect in the upward tendency of compression ratios of our automotive engines.

Where 4¼ to 1 was the average in 1922, now we have many that go well above 5 to 1, several 6 to 1, and those with compression ratios greater than 6 to 1 are not uncommon. We keep an up-to-date record of details of design of our engines, and a recent review shows a much greater tendency toward higher compressions than I had expected to find this soon. This subject of fuel, its relation to "knocking," motor-car performance, and efficiency is one of the most live subjects before you and engineers in our allied industries today; therefore, do not take it lightly, for some day you will discover your attitude has been a costly one, for we are now in only the beginning of an era of higher compression engines. This movement toward higher compression and efficiency will undoubtedly find the Diesel engine principle applied to automotive apparatus.

Some of you may be aware that as evidence of this trend a Packard Diesel engine of a weight per horsepower equally as low as that of our present aviation engines has recently made successful flights in an airplane. The use of the Diesel principle, in my opinion, is the ultimate answer to our motor-fuel question from the standpoint of "knocking," performance and fuel economy.

How Gasoline Acts

In regard to our immediate needs, let us consider some angles of the fuel problem. Among a great many there is a mistaken idea of how gasoline acts as a power medium. It commonly is referred to as "exploding" in the combustion chamber. Please note this part of the engine is named by the engineer "combustion chamber," not "explosion chamber." We do not want the gasoline to "explode." In the event of "explosion" we then encounter the objectionable "knocking" referred to above. We have an "explosion" as the power force in the discharge of firearms, artillery, etc., but not in the healthy combustion action within the gasoline engine cylinder.

With the gasoline engine we employ a "metering" device, still retaining the old name of carburetor, to apply a liquid fuel to the air stream going to the combustion chamber. By weight, the average air-fuel ratio is 1 part fuel to 12 to 15 parts air. The gasoline portion of the charge is used as a fuel to heat the compressed charge, resulting in expansion, force on the piston conveyed via the connecting rod to the crank shaft. The resulting heat of this combustion action figures out to be approximately 4,000 degrees Fahrenheit, depending on technical details. It, however, according to experiment, actually varies between 2,400 degrees Fahrenheit to 2,700 degrees Fahrenheit. According to Charles' gas law, for every degree rise above 32 degrees Fahrenheit of a gas in a confined space, the absolute pressure is raised 1/492. You, therefore, see how the heat from the burning fuel results in expansion or pressure on the piston.

$P_t = P_{32}$ (1/ 1/492 (T-32), or decimally

$P_t = P_{32}$ (1/ .002033 (T-32) = absolute pressure.

In our motor-car engines the above is modified owing to movement of the piston away from the combustion chamber, and here we have some phases of Gay-Lussac's gas law to deal with; however, it acts in harmony with the Charles gas law.

How much time have we for this burning action of the gas within the combustion chamber? In these days of high-speed engines, a car with the engine working on the road at 1,500 revolutions per minute is a fair everyday example. This means 25 revolutions per second, or a revolution in the twenty-fifth part of a second. Assuming 15 degrees of crank rotation for combustion, we have then 1/25 × 1/25, which equals 1/600 part of a second for this action. With this small time factor, is it any wonder that on engine test work we find an appreciable difference with various gasolines, dependent on their volatility characteristics. As we go to higher speeds this time factor becomes correspondingly less.

Volatility Requirements

In reference to the foregoing, one might become overenthusiastic relative to a mistaken interpretation of the volatility requirements, and get into trouble. For instance, with the earlier fractions distilling off at temperatures too low, we encounter the condition of burning, or trying to burn a fuel appreciably different from that which leaves the main supply tank of the car. You may meet with severe losses of gaseous fuel through the air vent of the vacuum tank, vapor lock in fuel lines, or the metering of a gaseous fuel instead of a liquid fuel into the air stream going to the combustion chamber, resulting in starving of the engine, loss of power, and frequently causing the motorist to stop.

Again I caution you not to consider this lightly, for it has been observed to be the unsuspected cause of more than one engine motor difficulty—a real gasoline trouble.

Initial Boiling Point

There is a mistaken importance attached to the initial boiling point and endpoint of the distillation range of gasoline owing to lack of knowledge of the real facts in the case. In reference to the initial boiling point and its influence on easy starting, to secure combustion our air-fuel ratio cannot be leaner than 17 to 1, and in view of the small amount involved in the initial boiling point fraction, it is obvious that there would have to be a large volume of the gasoline present in the charge for the initial boiling point fraction to furnish enough gas to result in combustion. It is the earlier percentages "over" that promotes easy starting rather than the initial boiling point. In regard to the endpoint we should consider the effect of using a 100 cubic centimeter Engler distillation flask at the time we are working with the endpoint and its effect on the reading indicated. From experience I prefer to consider the 90 per cent point off, and am not much interested in where the endpoint may be; however, our officials adhere rigidly to government motor gasoline specifications for marketing reasons.

In regard to change in fuel from the time it leaves the main fuel tank until the time it arrives in the intake manifold riser. Vacuum tank temperatures range from that of atmosphere to 120 degrees Fahenrenheit, and I have observed vacuum tank temperatures as high as 146 degrees Fahrenheit in one of our popular six-cylinder cars. On some cars the carburetor bowl temperature will go above that of the vacuum tank. The vacuum tank employs an air-vent tube in its design. When the valve on the air vent tube is open, we suffer a loss of gaseous fuel to the air, the amount depending upon the fuel itself, temperature of the vacuum tank, induced draft over the tank, the time the air vent is open, and how heavy a throttle is being used. With a light throttle opening, the loss is greatest under equal heat conditions.

Most of us know that carburetors are adjusted to feed too much gasoline. That is due to an unreasonable desire for greater acceleration. When the throttle is opened quickly, the air stream pulls away from the heavier gaseous fuel, causing a lag in the fuel speed with the air; richer adjustments serve to overcome that owing to the presence of excessive amounts of fuel. This air stream has a speed varying from 7,000 to 9,000 feet per minute. Of course, in some instances we encounter somewhat different velocities from that just mentioned.

A.S.T.M. Method

During the past few years there has been a dissatisfied feeling relative to the value of our A.S.T.M. distillation method. In some quarters it was felt the information developed by this method did not give us all that was required relative to the volatility of motor fuels as compared with the actual requirements. As a result, considerable interesting research on this subject occurred. Those participating in it were with the larger oil companies, government institutions, with some of the larger automotive manufacturers working in co-operation. Our most recent work in this country, of a public nature, took place in the Bureau of Standards, the result of which has been published by the American Petroleum Institute. Last winter I observed some of this work at the Bureau of Standards and talked with the engineers conducting that work.

In general, the consensus of opinion is that the information that has been developed to date warrants us placing more faith than formerly in our present A.S.T.M. distillation method, for it has proved to check very satisfactorily with more complicated methods of distillation in which engine conditions are also taken into consideration.

What we need in a gasoline is a fuel with the earlier boiling-point fractions lined up so as to promote easy starting, with the intermediate range, in an orderly succession of boiling points to promote good acceleration, and the balance of the gasoline of such character that it will function satisfactorily during the combustion period, and owing to its greater heat value will promote more miles and more work per gallon. In connection with the preceding our motor fuel should have a uniform rate of volatility; that is, a graph curve representing a picture of the figures of the distillation record of the fuel should have an even upward tendency toward the endpoint fraction. It is realized that the characteristics of the crude being worked with may offer some disturbing problems in producing the kind of a fuel we should have. However, the

*Meeting, Rocky Mountain Oil & Gas Association, Casper.

preceding remarks summarize developments to date and outline a satisfactory motor fuel.

Lubricants

In referring to lubricants, let us not lose sight of the objective when a lubricant is used in a gasoline engine. One use of the lubricant is for the purpose of reducing friction, which is the resistance that one body meets when moving in contact with another body. Friction is also a conversion of useful energy into useless heat. We have three major divisions of friction: (1) Sliding friction, such as a piston moving within a cylinder; (2) rolling friction, as in a ball or roller bearing; (3) liquid friction, or the resistance to movement within the particles of a liquid itself. The latter is our lowest known friction for practical consideration, and the art of lubrication is the substitution of this lowest and least frictional value for one of the other frictional values just mentioned. Aside from load pressures we can consider each of the moving surfaces as being coated with a film of oil; our friction is then between the two oil films or within the oil itself, and as we encounter greater resistance to movement in the heavier bodied oils, we correspondingly find greater frictional losses on going to heavier bodied oils, if one considers the body or viscosity of the oil only. This subject will be touched on later.

Another purpose of a lubricant in the gasoline engine is to act as a liquid seal around and on the piston rings. Still another purpose is for the conveying of heat from the working surfaces as it flows or is worked over the frictional points.

Heavier Grade Oils

There seems to be a general tendency on the part of operators and others to recommend heavier grades of oil than should really be used. When a heavier grade of oil than the correct grade is used, frictional losses are increased. This has been proven several times in dynamometer room work in our department, also on road work. The greatest factor involved in this loss is owing to the shearing of the oil film by the piston rings; the hydraulic resistance encountered is approximately 10,000 pounds per square inch, and as the resistance to shear increases as we go to heavier oils, it can then be realized that using a heavier oil than is required will result in reduction of delivered power. Motorists and others may feel they are practicing economy by using heavier oils when it seems their lubricating oils consumption is lower.

They overlook the fact, however, that they are paying a handsome price for the heavier product in the additional amount of fuel that will be consumed.

That has been proved in the engine laboratory, also during road-test work. The losses resulting from use of too heavy a lubricant has been investigated by many engineering laboratories outside of those of the larger oil companies. For your information, the following is the result of test work of that nature by the Waukesha Motor Works on an engine that was accepted as typical of the condition of an ordinary engine in everyday work:

Grade of oil—	Pull in lbs.
Gargoyle Mobile Arctic	184
Gargoyle Mobile "A"	180
Gargoyle Mobile "BB"	170
Gargoyle Mobile "B"	160

We believe improvements will result if those in the automotive industry cooperate with those in the oil industry in advising the motorist to drain the crankcase while the motor oil is warm and as soon as possible after the motor is stopped. This is due to the sludges that are bound to occur owing to accumulation of moisture and foreign matter in the crankcase that becomes mixed with oil. They are soluble in warm oil and can be eliminated from the motor better when the oil is warm. When the oil is cold the sludge separates and settles to the bottom of the crankcase and is not eliminated properly if crankcases are drained while cold.

Value of Filters

In the last few years we have had a wonderful improvement with the installation of crankcase filters, etc., however, owing to sales propaganda the motorist is not going to secure as much benefit from this improvement as he should. With these devices the oil will be maintained in a healthier condition. The crankcase, however, should be drained at reasonable periods and fresh oil placed in service. We then have the benefit of a much healthier oil film than can possibly be true when trying to run 2,000 and 3,000 miles between drainings as is recommended by some. The oil filter cannot start to perform in extraction of dirt from the oil until the dirt arrives in the crankcase. The majority of the dirt, grit, etc., is taken in through the intake valve and will mingle with the oil film on the cylinder wall to a certain extent, eventually arriving in the crankcase, then the oil filter can do its work. Of course, it is not of sufficient capacity or volume to handle the entire system, and there will be circulation of grit with the oil in varying degrees. The dust, or grit particles, have accomplished a certain amount of their destruction in their travel through the motor to the crankcase, therefore, it seems the best precaution is to use an efficient type of air cleaner combined with the crankcase oil filter.

Danger of Sludging

Sludging referred to above is perhaps more dangerous than realized. When the condition is severe and fine mesh oil screens are used, sludge may cover the screen to the extent of starving the oil pump resulting in interruption or lack of oil in sufficient volume to the working surfaces thereby promoting possibilities of metallic abrasion and damage to the motor. There is a sort of a reverse English on this problem for if we have oil screens of large enough mesh to prevent difficulties as just mentioned, we are then promoting the possibility of allowing grit or dirt to go through the screen and be circulated with the oil.

The answer to this problem is larger screens of small mesh constructed in such shape as to reduce to a minimum danger of sludge causing oil pump starving. This should be used in connection with pumps and lines that are inside the crankcase and not exposed to the atmospheric temperature. Submerged pumps are preferable to elevated pumps owing to positive assurance of pump priming and oil delivery with a cold motor.

Among the major items that we must analyze quite thoroughly relative to the proper lubricant to use in an engine are the following: Distributing system or lubricating system employed, for the very good reason that no lubricant can do us any good until it is delivered to where it is needed, hence distribution is one of the first and most important questions relative to lubrication. This subject is subdivided owing to its great importance on motor lubrication. It is not only the type of lubricating system involved, but the mesh, size, and area of oil screens and their location; oil pumps whether plunger or gear, elevated or submerged in the oil, and located in the crankcase or outside the crankcase, and exposed oil lines. The type of cooling provided is always important owing to the resulting operating temperatures and

Friction pull in lbs.	B.M.E.P.	B.H.P.	M.E.%
16	92	46	92
20	90	45	90
30	85	42	85
40	80	40	80

the characteristic feature of all oils to become more fluid with increased heat.

The number of piston rings and size and location, are important items to give consideration to owing to the necessity of proper sealing. The compression of the engine and its sensitiveness to carbon deposits must be dealt with before making a recommendation as some oils volatilize from the combustion chamber more thoroughly than others. The piston material is of great importance owing to the fact that other things being equal an engine with a cast iron piston is more sensitive to carbon deposits or detonation, than one with an aluminum piston.

Then again we have to consider the fact that cast iron and aluminum piston frictional surfaces act differently and this one factor alone may be sufficient in some instances to influence the entire recommendation. The number of bearings and their dimensions are also of considerable importance as it reveals how heavily loaded the bearings may be on a peak load condition. The above are only a few of many details of great interest to the lubricating engineer.

FURNACE OILS FEATURE OF CHICAGO MARKET

(Continued from Page 146)

sideration than was given them last summer.

Many of these distributors made the best of a bad situation last summer. They had to have the gasoline and they bought where they could but just as soon as they could obtain supplies from refiners who would at least meet their wants in part, they swung their purchases to them and some sellers were not fully cognizant of the feelings of their jobber customers until the latter expressed themselves. In some cases the expression was very fervent, if far from dignified, as to the language employed.

Refiners' Side

Now there is the refiners' side to the picture, but there are quite a number of substantial and well established jobbers who feel they have always played a square game with their refiner and no amount of explanation will make them believe they were not treated badly by their former sources of supply when the latter with little and some claim no more warning than a new contract sent them to sign, cuts their margin down to 3½ cents. They say the refiner tells them to cancel the contracts made with their customers. That cannot be done in a minute. Some of these dealers have a good deal more to say but what has been said shows how some of the best class of distributors feel regarding the position in which they have been placed.

Industries have a way of finally reaching an adjustment which permits all in the industry to make at least a living profit. Many oil men are more scared than necessarily hurt by the changes made in the marketing methods. The head of one of the largest independent organizations in the Middle West tells that when his business was new a number of years ago, something was done that they were told would put them out of business. They were worried but kept on and when the something was done they managed to stay in business and make money and increase their sales. It seems to him that each year something takes place which is supposed to mean the end of their business but they have ceased to worry. He says that in addition to a knowledge of the business essentials to continuance are a sufficient working capital and a will to work. There are many who do not possess either of these two essentials and their chances for success are good so long as there is no competition worth speaking of. Their danger is that when they do have competition they will fall into the great error of mistaking gallonage for profit. The Chicago fuel oil distributors have been trying to make gallonage look like profits. Contracts for the tank wagon delivery of 18-22 gravity fuel oils are being carried out on which the prices are as low as 4 cents and from that up to 4½ cents. The cost of the oil to the distributor is known and his freight costs. If the usual commission to the salesman of one-quarter of a cent is paid, that fuel oil is being delivered at a gross profit of one-third of a cent. Not one of these contracts pays a gross profit of a cent a gallon. No net profit in that.

EDWARD MINOR DIES

Edward Minor, of Houston, Tex., father of C. R. Minor, vice president of the Gulf Refining Co., of Shreveport, La., died at his home in Houston recently. His death, at the age of 70, ended a brief illness. Besides C. R. Minor he is survived by another son, H. D. Minor of Houston, his widow and five grandchildren.

LUBRICANTS STRONGER IN EASTERN AREA

(Continued from Page 147)

There were no cargo inquiries in the market, but refiners were busy in getting out shipments against orders previously booked. Some of the large refiners are sold up on their high test gasolines for the balance of the year. Export quotations on both gasoline and kerosene remain unchanged.

Heavy export buying of lubricating oils has tended to put the market in firmer position this week. Operators look for a continuance of this buying movement for another week at least, pointing out the fact that export sales for the previous few weeks have been under normal for this season of the year. Relatively little demand for either gas or fuel oils is reported in export markets. Some of the large sugar companies operating in Cuba and Hayti and San Domingo are in the market with inquiries for fuel oil for their 1929 requirements, however.

Petroleum Exports

The following table shows principal exports of petroleum and refined petroleum products from New York during the past three weeks (all figures in gallons unless otherwise noted):

	Week ended		
	Nov. 17	Nov. 10	Nov. 3
Gasoline	88,670	637,700	559,100
Naphtha	894,900	2,297,400	1,082,000
Kerosene	12,600	1,175,400	163,400
Fuel oil	7,800	2,335,500	53,600
Lubricating oil	1,942,600	1,375,000	1,464,000
Petroleum (ref.)	850,700	262,400	2,993,000
	Pounds		
Petrolatum	12,800	.....	.....
Paraffin wax	2,438,400	1,088,100	1,619,900
Refined	.....	119,900	.....
Scale	42,600	346,300	250,800
Lub. grease	1,539,000	1,232,900	1,173,300

California Oil Receipts

Receipts of California crude and refined oils at Atlantic and Gulf Coast ports for the week ended November 17 totaled 588,000 bbls., a daily average of 84,000 bbls., against 483,000 bbls., a daily average of 69,000 bbls. for the week ended November 10, and a daily average of 58,786 bbls. for the four weeks ended November 17.

(Barrels of 42 gallons)

At Atlantic Coast Ports—	Bbls.
Baltimore	146,000
New York	362,000
Philadelphia	80,000
Total	588,000
Daily average	84,000
Daily average 4 weeks	58,786

There were no receipts at Gulf Coast ports for the week.

Distribution of total California oil receipts is as follows:

Gasoline	526,000
Gas oil	62,000
Total	588,000

Practically all of the current movement of gasoline from California eastward is for the account of the integrated companies with California units, little open-market trading in Pacific Coast motor fuel for the account of the trade in the Atlantic Coast territory having been done during recent weeks, this being due to the easier market on gasoline in the East and the comparative firmness which has continued to prevail in California.

Imports

Imports of crude and refined oils at the principal United States ports for the week ended November 17 totaled 1,528,000 bbls., a daily average of 218,286 bbls., compared with 1,384,000 bbls., a daily average of 197,714 bbls. for the week ended November 10 and a daily average of 237,607 bbls. for the four weeks ended November 17.

(Barrels of 42 gallons)

At Atlantic Coast Ports—	Bbls.
Baltimore	108,000
Boston	145,000
New York	802,000
Philadelphia	267,000
Total	1,322,000
Daily average	188,857
At Gulf Coast Ports—	
Galveston	206,000
Total	206,000
Daily average	29,429
* At all United States Ports—	
Total	1,528,000
Daily average	218,286
Daily average 4 weeks	237,607

Brief Items for Petroleum Refiners

Sees Rapid Expansion In Consumption of Airplane Lubricants

CHICAGO, Nov. 24.—A rapid expansion in the consumption of motor fuel and motor lubricants by the airplane industry was predicted by E. F. Hallock of the Vacuum Oil Co., in the final session of the Oil Marketing Congress of the Independent Oil Men of America held here this week.

Speaking on the subject, "Aviation Lubrication," Mr. Hallock gave some figures to show the rapid growth of aviation as indicating the importance of the airplane to the oil industry. According to Mr. Hallock in 1927 there were 25 manufacturers of planes, today there are 250 and every one has so much business booked ahead that several months must be allowed between the placing of an order and its delivery.

In 1920 the number of planes manufactured was 100; in 1927, 2,000; in 1928, at least 8,000 and the estimated output of flying machines in 1929 is between 15,000 and 16,000. The number of completed landing fields has increased from 500 in 1926 to 1,600 today with at least 500 projected and in part completed.

The gasoline consumption by airplane according to this speaker is greatly in excess of the individual automobile. A single 200-horsepower Wright aviation engine will use 12 gallons of gasoline and 1 quart of oil an hour. Many planes have two or even three engines of greater horsepower and consuming a larger quantity of fuel and oil as the engine runs all the time at high speed. The aviator demands quality products for the reason that the best of oil and fuel are the greatest security against accidents involving heavy losses of life and investment.

One reason for the necessity for the best material that can be had is that the airplane engine is air cooled not water cooled. With water cooling the highest temperature with which the operator has to contend is about 250 degrees, that is the water boils at 212 degrees Fahrenheit or less and the cylinder temperature is held at 250 degrees or approximately that degree of temperature. With an air-cooled engine the cylinder temperature is much higher, can go above the safety point with even the best fuel and oil and is easily above that point with inferior material.

Regarding the possible demand, Mr. Hallock stated there are five transcontinental lines organized, financed and practically ready to do business. The consumption of oil and gasoline by these lines would be very great but they would probably be served by the larger organizations but there were a great many smaller organizations which could be served by local oil concerns.

Diesel Engines

In closing, the statement was made not as a prediction but as a possibility that within five years the airplanes might be all using Diesel engines, using a heavier oil for fuel. The present automobile engine usually gives a 7 to 1 ratio of compression. The Diesel engine uses a 12 to 1 ratio. The gasoline engine operates with a spark, the Diesel cylinder is so heated by the great compression that the heavier oil ignites at once and burns with comparative slowness making a steadier power, as steady a push as the steam engine. The cost of the Diesel engine is about one-third as much as the high-class aviation engine. The trouble has been in introducing the oil into the cylinder against the pressure but some of the best engineering men are working on the problem and there is no doubt of ultimate success.

REFINERS CONSIDER FEASIBILITY OF ORGANIZING ON NATIONAL SCALE

The feasibility of organizing the refining industry on a national scale—a matter which has been considered from time to time in previous years—is again receiving serious consideration by representative refiners in all parts of the country east of California.

So far as known no method of organization has been agreed upon by those who are responsible for the renewal of interest in the plan but it is probable that some definite proposition will be presented to the refining industry in the near future. At the present time refinery associations are confined to the Western Petroleum Refiners Association and the National Petroleum Association. The membership of the former organization is largely confined to independent refiners operating in the Mid-Continent Field and the latter association serves a similar purpose for independent refiners in the eastern states centering in Pennsylvania.

A movement was recently started to organize the refiners in the Middle West. The proposition to date is largely tentative and it is not known just what form the organization will take. M. E. Griffith, who has served the Western Petroleum Refiners Association as treasurer for several years is in active charge of the organization work. It is planned to organize all the companies operating refineries in the middle western states as far east as Ohio and as far west as the Rocky Mountain states.

Some of the companies in this territory are already members of either the Western Petroleum Refiners Association or the National Petroleum Association or both. It is thought, however, that a separate organization which will devote its efforts to the problems peculiar to the middle western states can better serve the interests of these refinery organizations.

National Organization

Along with this spread in the sectional organization of the refining industry has come the agitation for some national form of organization. A few at least favor the merger of all the present associations and the organization of one large association which would function on a national scale. Others believe the logical method of organization is to continue the present associations with provision made for co-operative action on all matters of general importance. In this method of organization the present association would continue to handle the matters of sectional importance and any problems which are national in scope would be taken care of by a central organization.

The arguments offered in favor of a national organization are the same as have been presented in previous years. It is pointed out that the benefits of a constructive program inaugurated in one refining area are often nullified by the action of refiners operating in another section. This applies particularly to the control of refinery operations to prevent overproduction and the application of better marketing practices.

It is contended that the marketing of gasoline and practically all refinery products is national in scope and for that reason any constructive programs must be general and not confined to any particular area. In this connection past experience has shown that an overproduction confined to one area has often demoralized the markets of the entire country.

It is also believed that a national association or a central co-operative organization would secure the support of certain major refinery organizations which are not at present affiliated with any refinery association. The refining and marketing operations of these companies in most cases are either national in scope or cover a wide area. These companies naturally are not specially interested in any association whose activities are confined to one section of the country. The co-operation of these large companies it is felt is essential in any program looking to the betterment of conditions within the refining industry.

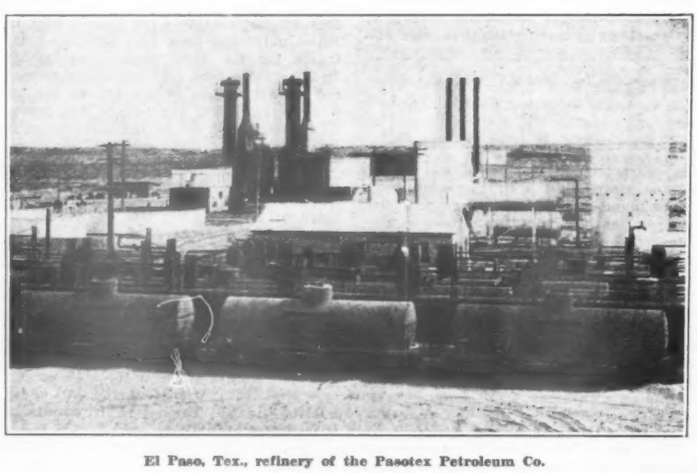
As indicative of the benefits to accrue to a more general organization of refiners, those interested point to the favorable refined market situation of the past six months. It is claimed that the program carried out by Mid-Continent refiners during the past year has been a major factor in bringing about this situation with permanent stabilization assured provided the co-operation of other refining areas is obtained.

REFINERY EXAMPLE OF COMPACT DESIGN

The new refinery of the Pasotex Petroleum Co. at El Paso, Tex., is an excellent example of compactness made possible by modern developments in plant design. The refinery as shown in the accompanying picture consisting of two pipe still units has rated capacity of 14,000 bbls. daily. The units are complete for the refining of gasoline and other light end products from West Texas crude oil.

With the old shell still type of plant under batch operation it is probable at least 100 stills would have been required to handle the crude runs, including the rerun operation. The plant was built in about eight months, indicating the speed in construction it is possible to obtain with modern equipment.

The Pasotex Petroleum Co. is a 100 per cent owned subsidiary of the Standard Oil Co. of California. The refinery is connected to West Texas crude production by a pipe line owned by the California Standard. The El Paso refinery was the first to be built by the Standard of California, outside of California. The plant is supplying a trade in Texas, New Mexico, Arizona and old Mexico. The company expects to expand its company-owned market facilities in that territory.



El Paso, Tex., refinery of the Pasotex Petroleum Co.

CREOLE TOPPING PLANT

NEW YORK, Nov. 24.—The Creole Petroleum Corp., a standard Oil Co. of New Jersey subsidiary, will construct a 2,000-bbl. topping plant at its terminal on Paraguana Peninsula, Venezuela. The plant will provide fuel oil for the lake tanker fleet operated by Creole, and in addition will supply a portion of the requirements of the Caribbean markets now served by the West Indian Oil Co., a marketing subsidiary of Standard Oil Co. of New Jersey.

Creole is building a large fleet of shallow-draft tankers for service on Lake Maracaibo. The first tanker of the fleet was launched last month at the Hebburn Yards of the Palmer Shipbuilding & Iron Co., Ltd., in England.

TO START REFINERY

FORT WORTH, Tex. Nov. 27.—The Del Rio Refining Co. plans to have its 5,000-bbl.-capacity plant constructed and in operation in Del Rio, Val Verde County, by January 15, 1929. The Amarillo Producers & Refinery Corp., T. R. Cowell, Jr., R. P. Humes and W. C. Adams of San Angelo recently organized the company.

Crude oil will be obtained from Mid-Kansas Oil & Gas Co., which has a tank farm at Del Rio. The Southern Pacific Railroad has contracted for the fuel. It is planned to start operations with a minimum run of 2,000 bbls. daily of Yates Pool crude.

TEXAS ACQUIRES PLANT

CHATHAM, Ontario, Nov. 24.—It is officially announced that the Texas Oil Co. is now sole owner of the International Refinery Co. plant at North Lethbridge, Alta. The International plant was owned by L. B. O'Neill and associates, including W. R. Wilson of Fernie, British Columbia. Mr. O'Neill sold his interests to the California Petroleum Co. later absorbed by the Texas Oil Co. and the latter has now acquired the W. R. Wilson half interest. The plant has been inoperative for some time, being used chiefly for oil storage.

GAVIN HEADS FUEL OIL SALES

CHICAGO, Nov. 24.—James H Gavin has been appointed manager of the local fuel oil distribution of the Sinclair Refining Co. Mr. Gavin is experienced in all branches of the oil business. He established the Gavin Oil Co., one of the prominent distributors of fuel oil in this city which is still operating. For several months Mr. Gavin has been connected with the department of which he is now made the head.

Natural Gasoline Manufacture

Natural Gasoline Production Gains in North and West Texas

FORT WORTH, Tex., Nov. 26.—Natural gasoline production in North and West Texas climbed to 30,190,294 gallons during the month of October. West Texas' contribution to the sum was only 585,538 gallons from one plant in Reagan County.

The Ranger district produced more than any other territory when the five counties reported a total of 13,286,518 gallons. This represents a substantial lead over the Panhandle which produced 12,791,858 gallons. Wichita Falls district was third in order with a production of 3,526,380 gallons.

Eastland County was the leading producing county in Ranger district with 6,058,032 gallons. Every county in the Ranger district reported an increase in production save Brown County which was down 30,000 gallons in comparison with the previous month's report. Eastland County's shipments for the month declined 126,412 bbls., while the remaining counties reported substantial gains in shipments during the month.

Stocks in the Ranger district remained practically stationary with a total of 1,261,015 gallons in storage. There are 75 plants in the territory and one plant in Brown County that was shut down in September was in operation during October.

While Panhandle's production was going up over 2,000,000 gallons, stocks also climbed from 1,892,276 gallons to 2,707,656 gallons. Phillips Petroleum Co. produced approximately two-thirds of the gasoline manufactured in Panhandle last month. That company's production was well over 8,000,000 gallons.

Tank car shipments out of the Panhandle increased to 873 cars for October against 731 cars for September. Hutchinson County remains the ranking producing county in the State and last month the seven companies with plants in that county had a total production of 8,439,610 gallons.

NATURAL GASOLINE PRODUCTION IN GALLONS—NORTH AND WEST TEXAS
For October, 1928

Panhandle	
Carson County	1,507,210
Gray County	2,190,865
Hutchinson County	8,439,610
Potter County	93,861
Wheeler County	560,312
Total October	12,791,858
Total September	10,539,180
Increase	2,252,678
Wichita Falls District	
Archer County	289,520
Burkburnett	1,417,760
Electra	721,440
Iowa Park	46,720
Petrolia	196,740
Throckmorton County	36,120
Vernon	94,520
Young County	723,560
Total October	3,526,380

Ranger District

County—	Prodn.	Shipm'ts.	Stock
Brown	752,314	691,202	103,000
Coleman	32,989	44,186	25,500
Eastland	6,058,032	5,177,540	392,520
Palo Pinto	556,723	493,865	46,250
Shackelford	986,210	985,350	109,420
Stephens	4,900,250	4,610,800	584,325
Ttl. Oct.	13,286,518	12,002,943	1,261,015
West Texas			
Reagan	585,538	497,500	34,000

CALIFORNIA OPERATIONS

California natural gasoline production for October totaled 48,383,139 gallons. This production in gallons was divided by fields as follows: Fullerton, 1,495,823; Midway, 4,849,277; Huntington Beach, 4,109,439; Long Beach, 18,412,997; Richfield, 1,546,831; Santa Fe Springs, 2,828,717; Seal Beach, 2,421,352; Ventura Avenue, 5,795,013; and all other fields, 6,923,690.

The October gasoline was obtained from 33,317,998,000 cubic feet of gas.

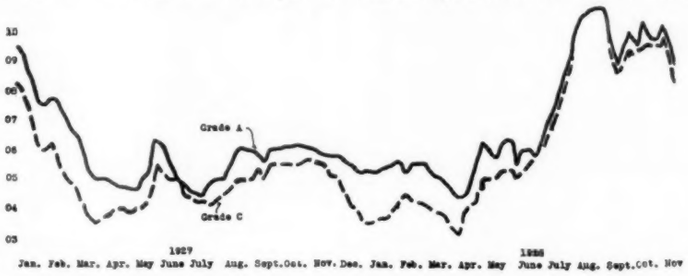
SMALLER MARGIN BETWEEN GRADES OF GASOLINE IN RECENT MONTHS

Less than the normal margin in prices has existed between the A grade and the C grade of natural gasoline in Oklahoma over the last six months and while the period of wide differentials comes during the colder months, it is probable the difference will be much less this coming winter season. The history of the price differentials for the last 22 months is shown in the accompanying chart and the nearness of the prices for the two grades over the last 6 months is clearly shown. The decided breaks in the two price curves came during December of last year and continued through April.

This was the result of the rapid development of the Seminole production and reflected the relatively poor control in manufacturing operations during the period. Plants were built to recover the gasoline from the available gas as quickly as possible and the production of the C grade of gasoline mounted during the cold weather due to natural conditions. It took several more months before stabilizers were added and production brought to a more uniform and controllable basis.

During the periods of wide differentials, the C grade price went as low as to be but 67 per cent of the A price and this is not representative of the difference naturally occurring in operation due to yields. Instead the relation in price between the A grade and the C grade over the colder months from a manufacturing standpoint alone would run more nearly as 1 is to .8 or the price on the C grade would be 80 per cent of the A grade price.

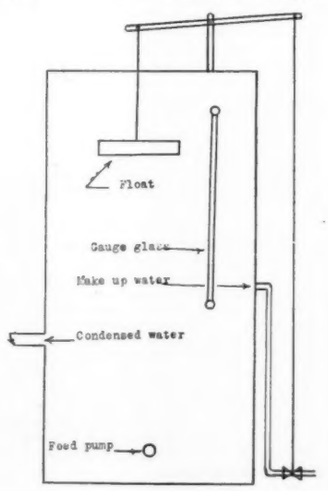
Possibly as the manufacture of bottle gas is developed and uses found for the increased production of butane resulting from the process of stabilizing, the C grade may assume a still higher relative value but this will only come over a relatively long period and because of the flexibility in the manufacturers operations the A grade could not be expected to be maintained too near the other grades or production would be rapidly diverted to it with the result prices would immediately fall.



A Practical Suggestion

HOT WELLS

It is almost imperative that a supply of noncorrosive and nonscale forming boiler feed water be available if an economical operation of a steam still plant is to be obtained. To assist in this problem it is necessary to save all of the condensed steam and return it to the boiler supply tank. This tank or pit is usually referred to as the hot well and in addition to assuring better water also supplies hot water that takes some of the work away from the boilers so that they can be loaded considerably more if necessary.



A HOT WELL

The hot well may be made of an old vacuum scrubber tank, the barrel of a discarded boiler or an ordinary small bolted tank. The preheater and exhausts of all steam pumps are discharged into the hot well with connections as shown in sketch. The make-up or raw water is controlled by a simple float. The float is made of wood and its motion is transmitted to a butterfly valve by two vertical one-quarter-inch rods and direct lever pivoted to a post that is welded to top of tank.

It is important that hot wells be connected with boiler feed pump suction at bottom of tank so that steam surging in tank will not cause it to "kick off." The make-up water should be at a higher elevation than condensed water and steam. As it has been cooler it will cause condensation of any steam entering well. The arrangement is entirely automatic.

Practical suggestions by those connected with the construction and operation of natural gasoline plants are invited. Payment will be made as soon as suggestions are accepted. Address all communications to the Natural Gasoline Department, The Oil and Gas Journal, Tulsa.

BOURQUE JOINS STAFF OF WESTERN REFINERS

At a meeting of the board of directors of the Natural Gasoline Association of America held in Tulsa, November 23, the resignation of A. V. Bourque as secretary and treasurer was accepted. Mr. Bourque resigned to accept a position with the Western Petroleum Refiners Association as assistant to the executive manager.

Mr. Bourque is one of the well-known figures of the natural gasoline industry

A. V. Bourque

and his resignation as the active head of the national association was regretted by the membership and the industry generally. Mr. Bourque became secretary of the association in 1921 when it was formed. At that time it was known as the Association of Natural Gasoline Manufacturers.

Devoting all his time to the association work he has been in active charge of the varied programs which have played an important part in the growth of the natural gasoline industry.

A committee consisting of H. A. Trower of the Phillips Petroleum Co., D. E. Buchanan of the Chestnut & Smith Corp., and E. L. Peck, Empire Oil & Refining Co., was appointed to choose Mr. Bourque's successor. Mr. Trower is president of the association and Messrs. Buchanan and Peck are former presidents.

The addition of Mr. Bourque to the staff of the Western Petroleum Refiners Association is a part of an expansion program recently authorized by the board of directors.

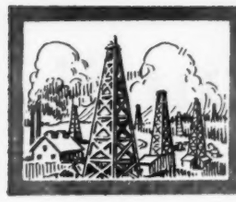
OHIO COMPANY COMBINES 3 ABSORPTION PLANTS

The Ohio Oil Co. has combined its three small oil absorption plants in the Haynesville Field of Louisiana into one plant of the absorption type. Two of the plants have been changed to booster stations. The one plant now has a rated capacity of 7,700 gallons daily.

The company during the past few weeks has made changes at some of its other plants. In the Salt Creek Field the capacity of its plant has been increased from 8,500 to 12,000 gallons daily. In the Cotton Valley Field the capacity of its plant is now rated at 12,000 gallons daily instead of 15,000 gallons.

In the Bridgeport district of Illinois

(Continued on Page 161)



REFINERY AND CRUDE PRICES

Quotations on refined products are for interstate or export movement unless otherwise noted.

GASOLINE AND NAPHTHA

OKLAHOMA (Group 3)—	Nov. 27		Nov. 20		Nov. 13	
50-52 450 endpoint	.08½	.08⅝	.08½	.08⅝	.08½	.08¾
56-58 450 endpoint	.08½	.08⅝	.08½	.08⅝	.08½	.08¾
58-60 450 endpoint	.08½	.08¾	.08⅝	.08¾	.08¾	
*58-60 437 endpoint (U. S. Motor)	.0927		.0932		.0933	
*60-62 437 endpoint	.0955		†.09	.09½	.0950	
*60-62 400 endpoint	.0984		.0975		†.09½	.09¾
*64-66 375 endpoint	.1056		.10375		.1075	
68-70 360 endpoint	.10	.10¼	.10¼	.10½	.10¼	.10½
64-66 437 endpoint (blend)	.09	.09¼	.09	.09¼	.09¼	.09½

*Weighted average prices November 27, 20 and 13 as reported by representative refiners. Sales to jobbers only. †No sales reported. Price general market.

NORTH TEXAS—						
56-58 450 endpoint	.08⅜	.08½	.08⅜	.08½	.08½	
58-60 450 endpoint	.08⅜	.08½	.08½		.08½	
58-60 437 endpoint (U. S. Motor)	.08½	.08⅝	.08⅝	.08¾	.08¾	
60-62 400 endpoint	.09¼	.09½	.09¼	.09½	.09¼	.09½
64-66 390 endpoint	.09½	.09¾	.09½	.09¾	.09½	.09¾
64-66 375 endpoint	.09¾	.10	.09⅞	.10	.09⅞	
68-70 360 endpoint	.10	.10¼	.10	.10¼	.10	.10¼
64-66 437 endpoint (blend)	.09	.09⅛	.09	.09⅛	.09	.09¼
NORTH LOUISIANA—						
58-60 437 endpoint (U. S. Motor)	.09¼		.09¼	.09⅜	.09½	
ARKANSAS—						
58-60 437 endpoint (U. S. Motor)	.09	.09⅛	.09¼		.09½	
PENNSYLVANIA—						
52-54 Naphtha	.10	.10¾	.09¾	.10	.10¼	.10½
54-56 Naphtha	.10	.10¼	.10	.10¼	.10½	.10¾
58-60 Gasoline	.10½	.10¾	.11	.11⅛	.11	.11⅛
60 Gasoline	.11½	.11¾	.11½	.11¾	.11½	.11¾
62 Gasoline	.12½	.12¾	.12½	.12¾	.12½	.12¾
64 Gasoline	.12¾	.13	.12¾	.13	.12¾	.13
CALIFORNIA—						
58-60 437 endpoint (U. S. Motor) domestic	.10	.11	.10	.11	.10	.11
CHICAGO DISTRICT (Based on Group 3)—						
50-52 450 endpoint (Naphtha)	.08½	.08¾	.08½	.08¾	.08¾	
56-58 450 endpoint	.08½	.08¾	.08½	.08¾	.08¾	.09
58-60 437 endpoint (U. S. Motor)	.08⅝	.09¼	.08¾	.09¼	.09	.09¼
60-62 400 endpoint	.09½	.09¾	.09½	.09¾	.09½	.09¾
64-66 375 endpoint	.10¼	.10½	.10¼	.10½	.10¼	.10½
68-70 360 endpoint	.10½	.10¾	.10¾		.10¾	.11
64-66 437 endpoint (blend)	.09	.09¼	.09¼	.09½	.09¼	.09½

NATURAL GASOLINE

OKLAHOMA (Group 3)—	Nov. 27		Nov. 20		Nov. 13	
Grade A, 72-79.9, 375 e.p., rec. 90%	.09¼		.08¾		.09⅜	
Grade AA, 80-87.9, 375 e.p., rec. 90%	.09⅛		.08¾		.09¼	.09⅜
Grade B, 76-83.9, 375 e.p., rec. 85%	.08½	.08⅝	.08⅜	.08½	.09⅛	
Grade BB, 84-92, 375 e.p., rec. 85%	.08½	.08⅝	.08⅜	.08½	.09⅛	
Grade C, 80-90, 375 e.p., rec. 78%	.08½		.08¼	.08⅜	.09⅛	
NORTH TEXAS—						
Grade A, 72-79.9, 375 e.p., rec. 90%	.09¼		.08¾	.08⅞	.09¼	
Grade AA, 80-87.9, 375 e.p., rec. 90%	.09¼		.08¾		.09¼	
Grade B, 76-83 9, 375 e.p., rec. 85%	.08⅝		.08⅜	.08½	.09	.09⅛
Grade BB, 84-92, 375 e.p., rec. 85%	.08⅝		.08⅜		.09	
Grade C, 80-90, 375 e.p., rec. 78%	.08½		.08¼		.09	.09⅛
NORTH LOUISIANA—						
Grade AA, 80-87, 375 e.p., rec. 90%	.09¼	.09⅝	.09	.09¼	.09½	
Grade BB, 84-92, 375 e.p., rec. 85%	.09		.08¾	.08⅞	.09⅜	.09½
Grade C, 80-92, 375 e.p., rec. 78%	.08⅝	.08¾	.08⅜	.08¾	.09¼	
CALIFORNIA—						
75-78, 375-390 endpoint	.07	.07½	.07	.07½	.07	.07½
CHICAGO DISTRICT (Based on Group 3)—						
Grade A, 72-79.9, 375 e.p., rec. 90%	.09¼		.08¾		.09⅜	
Grade AA, 80-87.9, 375 e.p., rec. 90%	.08¾		.08¾		.09¼	.09⅜
Grade B, 76-83 9, 375 e.p., rec. 85%	.08¼		.08⅜	.08½	.09¼	
Grade BB, 84-92, 375 e.p., rec. 85%	.08¾		.08⅜	.08½	.09⅛	
Grade C, 80-90, 375 e.p., rec. 78%	.08½		.08¼		.09	.09⅛

BURNING OIL

OKLAHOMA (Group 3)—	Nov. 27		Nov. 20		Nov. 13	
41-43 water white Kerosene	.05¾	.06	.05¾	.06	.05¾	.06
42-44 water white Kerosene	.06	.06¼	.06	.06¼	.06	.06¼
NORTH LOUISIANA—						
41-43 water white Kerosene	.06⅜	.06½	.06⅜	.06½	.06¾	
NORTH TEXAS—						
41-43 water white Kerosene	.05½	.05¾	.05⅝	.05¾	.05⅝	.05¾
40-42 water white Kerosene	.05½		.05½		.05½	
ARKANSAS—						
41-43 water white Kerosene	.06¼	.06½	.06¼	.06½	.06⅛	.06¼
PENNSYLVANIA—						
43 Kerosene prime white	.07¼	.07⅜	.07¼	.07⅜	.07¼	.07⅜
45 Kerosene water white	.07⅜	.07½	.07⅛	.07⅜	.07⅛	.07⅜
46 Kerosene water white	.07¾	.07⅞	.07⅝	.07⅞	.07⅝	.07⅞
47 Kerosene water white	.07¾	.08	.08	.08¼	.08	.08¼
300 Mineral Seal	.07¼	.07½	.07¼	.07½	.07¼	.07½
CALIFORNIA—						
38-40 water white Kero. (high-burning test)	.06¾	.07¼	.06¾	.07¼	.06¾	.07¼
Engine distillate, 43-44, 445 endpoint	.07½	.08	.07½	.08	.07½	.08
Engine distillate, 42-44, 480 endpoint	.07	.07½	.07	.07½	.07	.07½
CHICAGO DISTRICT (Based on Group 3)—						
41-43 water white Kerosene	.05¾	.06	.05¾	.06	.05¾	.06
42-44 water white Kerosene	.06¼	.06½	.06¼	.06½	.06¼	.06½

FUEL OILS

OKLAHOMA (Group 3)—	Nov. 27		Nov. 20		Nov. 13	
Below 18 Fuel Oil, per bbl.	.50	.55	.50	.55	.52½	.55
18-22 Fuel Oil, per bbl.	.55	.57½	.55	.57½	.55	.60
22-26 Fuel Oil, per bbl.	.60	.62½	.57½	.60	.57½	.60
24-26 Fuel Oil, per bbl.	.62½	.65	.60	.65	.60	.65
26-30 Fuel Oil, per bbl.	.65	.70	.65	.70	.65	.70
28-30 Fuel Oil, per bbl. (industrial)	.80	.82½	.77½	.82½	.77½	.82½
28-30 Fuel Oil, per bbl. (zero cold test)	.85	.87½	.85	.87½		
32-36 Gas Oil (dark)	.02⅜	.02½	.02⅜	.02½	.02⅜	.02½
32-36 Gas Oil (straw distillate)	.02½	.02⅝	.02½	.02⅝	.02½	.02⅝
36-38 Distillate	.03	.03¼	.03	.03¼	.03	.03¼
38-40 Straw Distillate	.03⅜	.03⅝	.03¼	.03½	.03¼	.03½
NORTH TEXAS—						
Below 20 Fuel Oil	.50	.52½	.50	.52½		
24-26 Fuel Oil, per bbl.	.52½	.55	.52½	.55	.52½	.55
32-36 Gas Oil (straw)	.02¼	.02⅜	.02¼	.02⅜	.02¼	.02⅜
38-40 Straw Distillate	.03⅛	.03¼	.02⅞	.03	.02⅞	.03
NORTH LOUISIANA—						
18-20 Fuel Oil, per bbl.	.70	.75	.70	.75	.75	.80
32-36 Gas Oil	.03	.03¼	.03	.03¼	.03	.03¼
ARKANSAS—						
33-36 Distillate	.03¼	.03½	.03¼	.03½	.03¼	.03½
32-36 Gas Oil (straw)	.03		.03		.03	
16-22 Refinery Fuel Oil, per bbl.	.75		.75		.75	.80
GULF COAST (South Texas)—						
Gas Oil	.04	.04½	.04	.04½	.04	.04½
Bunker C Fuel, per bbl.	.80	.90	.80	.90	.80	.90
PENNSYLVANIA—						
30-34 Fuel Oil	.04⅜	.04⅝	.04¼	.04½	.04¼	.04¾
36-40 Fuel Oil	.04⅝	.04¾	.04⅝	.04¾	.04⅝	.04¾
CALIFORNIA—						
33-36 Distillate	.03¾	.04	.03¾	.04	.03¾	.04
27-32 Distillate	.03		.03		.03	.03½
*15-20 Fuel Oil, Bunker (at tide water)	.85	1.00	.85	1.00	.85	1.00
15-20 Fuel Oil (cargo lots), per bbl.	.75	.85	.75	.85	.75	.85
27 plus Diesel, per bbl.	1.15	1.19	1.15	1.19	1.15	1.19
CHICAGO DISTRICT (Based on Group 3)—						
22-26 Fuel Oil, Group 3, bbl.	.60	.65	.60	.65	.60	.65
18-22 (Group 3), per bbl.	.50	.55	.52½	.57½	.52½	.57½
16-20 Smackover, per bbl.	.85	.90	.85	.90	.85	.90
32-36 Gas Oil, zero	.02⅞	.03⅛	.02⅝	.02⅞	.02⅝	.02⅞
32-36 Gas Oil (industrial)	.02⅝	.02⅞	.02⅜	.02½	.02⅜	.02⅝
36-38 Distillate	.03¼		.03¼			.03½
38-40 Straw Distillate	.03⅜	.03½	.03⅜	.03½	.03⅜	.03⅝

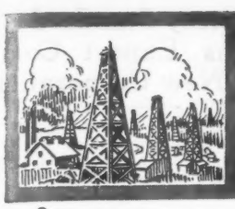
*Bunker.

LUBRICATING OIL AND WAX

OKLAHOMA (Group 3)—	Nov. 27		Nov. 20		Nov. 13	
100 vis., 2 color, 20-25 cold test	.06	.06¼	.06	.06¼	.06¼	.06½
100 vis., 3 color, 20-25 cold test	.06		.06		.06	.06¼
150 vis., 3 color, 20-25 cold test	.08	.08¼	.08	.08¼	.08¼	.08½
150 vis., 4 color, 20-25 cold test	.08		.08		.08	.08¼
180 vis., 3 color, 23-28 cold test	.09¼	.09½	.09¼	.09½	.09⅜	.10
180 vis., 4 color, 23-28 cold test	.09	.09¼	.09	.09¼	.09¼	.09½
180 vis., 5 color, 23-28 cold test	.09	.09¼	.09	.09¼	.09⅛	.09½
200 vis., 3 color, 23-28 cold test	.09¼	.09½	.09¼	.09½	.09½	
200 vis., 4 color, 23-28 cold test	.09⅛	.09¼	.09⅛	.09¼	.09⅜	
200 vis., 5 color, 23-28 cold test	.09	.09¼	.09	.09¼	.09¼	
240 vis., 3 color, 25-30 cold test	.13½	.13¾	.13½	.13¾	.13¾	
240 vis., 4 color, 25-30 cold test	.13	.13¼	.13	.13¼	.13¼	
240 vis., 5 color, 25-30 cold test	.12	.12¼	.12	.12¼	.12¼	
280 vis., 3 color, 25-30 cold test	.15¼	.15½	.15¼	.15½	.15½	
280 vis., 4 color, 25-30 cold test	.14¾	.15	.14¾	.15	.15	
280 vis., 5 color, 25-30 cold test	.13¾	.14	.13¾	.14	.14	
Cylinder Stocks:						
600, steam refined, light green	.08	.09	.08	.09	.08	.09
600, steam refined, dark green	.06	.06½	.06	.06½	.06	.06½
190-200 vis., @ 210 Bright Stock	.29	.30	.29	.30	.29	.30
150-160 vis., @ 210 Bright Stock	.25		.25		.25	
Waxes:						
124-126 White Crude Scale Wax	.04¾	.05¼	.05	.05½	.05	.05½
PENNSYLVANIA—						
34 Neutral	.07½	.07¾	.07½	.07¾	.07½	.07¾
34 Sundebloom	.08¼	.08½	.08¼	.08½	.08¼	.08½
36 Miners' Neutral	.07½	.07½	.07	.07½	.07	.07½
150, 3 color	.20½	.21	.20½	.21	.20½	.21
180, 3 color	.24½	.25	.24½	.25	.24½	.25
200, 3 color	.27½	.28	.27½	.28	.27½	.28
220, 3 color	.30½	.31	.30½	.31	.31½	.32
600, steam refined	.17	.17½	.15	.15½	.14	.14½
635, steam refined	.18¼	.18½	.17	.17½	.15½	.16
650, steam refined	.20	.20¼	.18½	.19	.17½	.18½
600, Pennsylvania flash	.22½	.23	.21½	.22	.21½	.22
*550, E filtered	.16	.16½	.15	.15½	.15	.15½
*600, E filtered	.17½	.18				
600, E filtered	.19	.19½	.18	.18½	.18	.18½
600, D filtered	.25½	.26	.24½	.25	.24½	.25
550, E filtered	.15½	.16	.15½	.16	.15½	.16
550, D filtered	.21½	.22	.21½	.22	.21½	.22
Pennsylvania Bright Stock	.34½	.35	.33	.33½	.33	.33½
†122-124 White Crude Scale Wax	.05¼	.05⅜	.05¼	.05⅜	.05¼	.05⅜
†124-126 White Crude Scale Wax	.05⅜	.05½	.05⅜	.05½	.05⅜	.05½

*At Warren, Pa. †At New York.

GULF COAST (South Texas)—						
No. 2 color, 100 vis., pale oil	.06½	.07	.06½	.07	.06½	.07
No. 3 color, 200 vis., pale oil	.08½	.09	.08½	.09	.08½	.09
No. 3 color, 300 vis., pale oil	.11	.11½	.11	.11½	.11	.11½
No. 3½ color, 500 vis., pale oil	.12½	.13	.12½	.13	.12½	.13
No. 4 color, 750 vis., pale oil	.15	.15½	.15	.15½	.15	.15½
No. 5 to 6 color, 200 vis., red oil	.08¼	.08½	.08¼	.08½	.08¼	.08½
No. 5 to 6 color, 300 vis., red oil	.09¼	.09½	.09¼	.09½	.09¼	.09½
No. 5 to 6 color, 500 vis., red oil	.10½	.11½	.10½	.11½	.10½	.11½
No. 5 to 6 color, 750 vis., red oil	.13¼	.14	.13¼	.14	.13¼	.14
No. 2½ color, 200 vis., pale filtered	.11¾	.12¼	.11¾	.12¼	.11¾	.12¼
No. 2½ color, 300 vis., pale filtered	.13½		.13½		.13½	
No. 2½ color, 500 vis., pale filtered	.15½	.16	.15½	.16	.15½	.16
No. 2½-3 color, 750 vis., pale filtered	.18	.20	.18	.20	.18	.20
CALIFORNIA—						
130 vis., 2½-3 color	.10¼	.11	.10¼	.11	.10¼	.11
200 vis., 2½-3 color	.11½	.12	.11½	.12	.11½	.12
300 vis., 3-3½ color	.13	.13½	.13	.13½	.13	.13½



REFINERY AND CRUDE PRICES

Quotations on refined products are for interstate or export movement unless otherwise noted.

350 vis., 3½-4 color	.13½	.14	.13½	.14	.13½	.14
400 vis., 3½-4 color	.15	.16	.15	.16	.15	.16
Red Neutral:						
200 vis., 4½-5 color	.11½	.11¾	.11½	.11¾	.11½	.11¾
300 vis., 5-6 color	.11¾	.12½	.11¾	.12½	.11¾	.12½
400 vis., 5-6 color	.13½	.14½	.13½	.14½	.13½	.14½
500 vis., 4½-5 color	.15	.15½	.15	.15½	.15	.15½
500 vis., 5-6½ color	.15¼	.15¾	.15¼	.15¾	.15¼	.15¾
600 vis., 6½ plus color	.15½	.16	.15½	.16	.15½	.16

Note: Bright stocks are not manufactured commercially on the Pacific Coast.

NEW YORK (BAYONNE) REFINERY PRICES

	Nov. 27	Nov. 20	Nov. 13
Gasoline, U. S. Motor, 58-60 437	.11	.11	.11
Kerosene, water white, 41-43	.09	.09	.09
*Fuel Oil, Bunker "C," 14-16, per bbl.	1.05	1.05	1.05
†Fuel Oil, Diesel, 28-30, per bbl.	2.00	2.00	2.00
Gas Oil, 32-36 gravity	.05¼	.05¼	.05¼
25 pale Paraffin Oil	.11¾	.11¾	.11¾
28 pale Paraffin Oil	.07½	.07½	.07½
285 red Paraffin Oil	.11½	.11½	.11½
250 red Paraffin Oil	.11	.11	.11
225 red Paraffin Oil	.09½	.09½	.09½
200 red Paraffin Oil	.09	.09	.09
Refined Wax:			
120-122 a.m.p., per lb.	.05¾	.05¾	.05¾
125-127 a.m.p., per lb.	.05⅞	.05⅞	.05⅞
130-132 a.m.p., per lb.	.06¾	.06¾	.06¾
133-135 a.m.p., per lb.	.07⅜	.07⅜	.07⅜
135-137 a.m.p., per lb.	.07¾	.07¾	.07¾
Petrolatum, in bbls., carload lots, per lb.:			
Dark green	.02	.02	.02
Amber	.03½	.03½	.03½
Extra amber	.03¾	.03¾	.03¾
Cream	.06½	.06½	.06½
Lily white	.07½	.07½	.07½
Snow white	.08½	.08½	.08½

*Lighterage, 5.0c a barrel extra. †Lighterage, 6.5c a barrel extra.

NEW YORK (BAYONNE) EXPORT PRICES

	Nov. 27	Nov. 20	Nov. 13
Gasoline, U. S. Motor, 58-60 437, in cases	.2640	.2640	.2640
Kerosene, standard white, in cases	.1765	.1765	.1765
Kerosene, water white, in cases	.1890	.1890	.1890
600, steam refined cylinder stocks, in bbls.	.23½ .24	.22½	.21
635, steam refined	.24½ .25	.23½	.22
650, steam refined	.26½ .27	.26	.24
600, Pennsylvania flash	.30	.26	.26
630, Pennsylvania flash	.37	.34½	.34½
600, Warren E	.27	.25½	.25½
600, Oil City E	.26	.24½	.24½
Light 140-150 Bright Stocks	.41	.42	.40
Dark 140-150 Bright Stocks	.43	.40½	.39

LOS ANGELES EXPORT PRICES

	Nov. 27	Nov. 20	Nov. 13
Kerosene, water white	.05¼ .06¼	.05¼ .06¼	.05¼ .06¼
U. S. Motor Gasoline, 53-55, 437 e.p.	.08¼ .09	.08¼ .09	.08¼ .09

CALIFORNIA CRUDE OIL PRICES

Standard Oil Co.-Union Oil Co. (Effective August 15, 1928)*

Gravity—	1 Richfield, Torrance, Olinda-Brea, Alamitos Hts., Signal Hill, Seal Beach, Huntington Beach, Athens, Rosecrans-Domingues, Inglewood	2 Whittier, La Habra, Coyote Hills	3 †Kern River, Newhall-McKittrick, Midway-Sunset, Elk Hills, Lost Hills, Bolridge, Buena Vista Hills	4 Montebello	5 Santa Fe Springs	6 Coalinga	7 Wheeler Ridge	8 Olcott	9 Ventura
14 to 14.9	.85	.85	.75	.85	....	.75	.75	.85	.85
15 to 15.9	.85	.85	.75	.85	....	.75	.75	.85	.85
16 to 16.9	.85	.85	.75	.85	....	.75	.75	.85	.85
17 to 17.9	.85	.85	.75	.85	....	.75	.75	.85	.85
18 to 18.9	.85	.85	.75	.85	....	.75	.75	.85	.85
19 to 19.9	.85	.85	.77	.86	....	.77	.77	.85	.85
20 to 20.9	.85	.85	.77	.86	....	.77	.77	.85	.85
21 to 21.9	.89	.88	.79	.89	.89	.79	.79	.86	.86
22 to 22.9	.93	.91	.82	.92	.92	.82	.82	.87	.87
23 to 23.9	.97	.94	.86	.95	.95	.85	.85	.90	.90
24 to 24.9	1.01	.97	.90	.98	.98	.88	.88	.93	.94
25 to 25.9	1.05	1.00	.95	1.01	1.01	.91	.91	.96	.98
26 to 26.9	1.09	1.04	1.00	1.04	1.04	.94	.94	.97	1.02
27 to 27.9	1.13	1.08	1.05	1.07	1.07	.98	.97	....	1.06
28 to 28.9	1.17	1.12	1.10	1.10	1.10	1.02	....	....	1.10
29 to 29.9	1.21	1.16	1.18	1.13	1.15	1.06	....	....	1.14
30 to 30.9	1.25	1.20	1.22	1.16	1.20	1.10	....	....	1.18
31 to 31.9	1.30	....	1.28	....	1.25	1.14	....	....	1.23
32 to 32.9	1.35	....	1.34	....	1.30	1.18	....	....	1.28
33 to 33.9	1.41	....	1.40	....	1.35	1.22	....	....	....
34 to 34.9	1.47	....	1.46	....	1.40	1.26	....	....	....
35 to 35.9	1.53	....	....	....	1.45	1.30	....	....	....
36 to 36.9	1.59	....	....	....	1.50	....	....	....	....
37 to 37.9	1.65	....	....	....	1.55	....	....	....	....
38 to 38.9	1.71	....	....	....	1.60	....	....	....	....
39 to 39.9	1.77	....	....	....	1.65	....	....	....	....
40 to 40.9	1.83	....	....	....	....	....	....	....	....
41 to 41.9	1.89	....	....	....	....	....	....	....	....
42 to 42.9	1.95	....	....	....	....	....	....	....	....

*Column 1—Signal Hill, Seal Beach, Huntington Beach and Alamitos Heights crude, 14 to 32.9 gravity, inclusive; Richfield, Olinda-Brea and Fullerton, 14 to 30.9 gravity; Torrance and Inglewood, 14 to 28.9 gravity. Domingues and Athens-Rosecrans, 24 to 42.9 gravity.

Column 2—Whittier crude, 14 to 22.9 gravity; Coyote Hills, 14 to 30.9 gravity.

Column 3—Kern River, Newhall and McKittrick, 14 to 19.9 gravity; Midway-Sunset, Buena Vista and Elk Hills, 14 to 33.9 gravity; Lost Hills, 14 to 34.9 gravity.

Columns 8 and 9 posted by Union Oil Co. only.

†On October 2 Standard Oil Co. of California discontinued contracting for purchase of Kern River crude and on October 20 established following prices on grades below 14 gravity—11 to 11.9 degrees at 45 cents, 12 to 19 degrees at 50 cents.

CRUDE OIL GRAVITY TABLE

Gravity—	1 Okla., Kans., N. C. Tex.	2 No. La. and Arkansas	3 Smackover, Ark.	4 Stephens, Ark.	5 Gray County (Texas Panhandle)	6 Salt Creek, Wyo.	7 Grade B & Light Crude (S. Coast)	8 Somerset, (South Central Texas)
24 and above	....	....	.90	....	....	....	....	....
Below 24	....	....	.75	....	....	....	....	....
Below 25	.60	....	....	....	....	....	1.16	....
25 to 25.9	.67	....	....	....	....	....	....	....
Below 26	....	....	....	....	....	....	....	....
26 to 26.9	.74	....	....	....	....	....	1.19	....
27 to 27.9	.81	....	....	....	....	....	1.21	....
Below 28	....	.81	....	.75	.68	....	....	....
28 to 28.9	.88	.88	....	.77	.68	....	1.23	....
29 to 29.9	.96	.96	....	.79	.75	1.05	1.25	....
30 to 30.9	1.02	1.02	....	.81	.82	1.02	1.27	....
31 to 31.9	1.09	1.09	....	.83	.89	1.09	1.29	....
32 to 32.9	1.16	1.16	....	.85	.96	1.16	1.31	1.05
33 to 33.9	1.21	1.21	....	....	1.01	1.21	1.33	1.07
34 to 34.9	1.26	1.26	....	....	1.06	1.26	1.35	1.09
35 to 35.9	1.31	1.31	....	....	1.11	1.31	1.37	1.11
36 to 36.9	1.36	1.36	....	....	1.16	1.36	....	1.13
37 to 37.9	1.41	1.41	....	....	1.21	1.41	....	1.15
38 to 38.9	1.46	1.46	....	....	1.26	....	....	1.17
39 to 39.9	1.51	1.51	....	....	1.31	....	....	....
40 to 40.9	1.56	1.56	....	....	1.36	....	....	....
41 to 41.9	1.61	1.61	....	....	1.41	....	....	....
42 to 42.9	1.66	1.66	....	....	1.46	....	....	....
43 to 43.9	1.71	1.71	....	....	1.51	....	....	....
44 and above	1.76	1.76	....	....	1.56	....	....	....

Column 1—Magnolia Petroleum Co. posted schedule August 2, 1928, making price below 25 gravity 60 cents per barrel, 25-25.9 gravity 67 cents, 26-26.9 gravity 74 cents, and 27-27.9 gravity 75 cents, 30-30.9, 90 cents, and 31-31.9, $1.05, with balance of the price schedule as shown.

Oklahoma—Prairie Oil & Gas Co., Sinclair Oil & Gas Co., Gypsy Oil Co., Carter Oil Co., The Texas Company, July 26.

North Central Texas—[Including Ranger, Mexia, Powell, Richland, Wortham, Lytton Springs (Southwest Texas, Iatan and Panola (Iatan posted at flat price of 93 cents by Magnolia on January 14, 1928).] Currie, Nocona and Moran. Prairie, Sinclair and Gulf; The Texas Company, Humble Oil & Refining Co., July 26.

Kansas—Prairie, Sinclair; Carter, The Texas Company, July 26.

Column 2—Arkansas and North Louisiana—[Caddo, Bull Bayou, Crichton, De Soto, Haynesville, Homer and El Dorado only], Standard Oil Co. of Louisiana, Louisiana Oil Refining Co., and Gulf Refining Co., August 2. Magnolia Petroleum Co. schedule effective August 7 applies to Pine Island, Haynesville, Bull Bayou, Louisiana, and El Dorado, Ark., light crude. The Texas Company August 8 posted prices below 28 gravity at 7 cents differential per degree with minimum of 60 cents for all below 25 gravity.

Column 3—February 6, Louisiana Oil Refining Co. February 7, Standard Oil Co. of Louisiana, The Texas Company, Gulf Refining Co., Magnolia Petroleum Co. February 8, and on February 10, Atlantic Production Co.

Column 4—Atlantic Oil Producing Co., Louisiana Oil Refining Corp., August 8.

Column 5—Humble Oil & Refining Co., July 26.

Column 6—Midwest Refining Co., July 26. All crude over 37 gravity, $1.41 per barrel.

Column 7—Humble Oil & Refining Co. and other major buyers (schedule ends 35 and above), March 14, with exception of Magnolia Petroleum Co., which stops at 31 degrees gravity. Sun Pipe Line Co. and The Texas Company posted 2 cents differential for each degree above 35 gravity and $1.47 for 40 gravity and above.

Column 8—Grayburg Pipe Line Co. and Pioneer Oil & Refining Co., April 7.

CRUDE OIL PRICES

OKLAHOMA, KANSAS, NORTH AND EAST CENTRAL TEXAS

Corsicana heavy (March 14, 1927)* $1.00
Other fields ..... See gravity table

*Posted by Magnolia Petroleum Co.

TEXAS PANHANDLE
Carson and Hutchinson

Below 32 gravity	$ .69
32-32.9	.76
33-33.9	.81
34-34.9	.86
35-35.9	.91
36-36.9	.96
37-37.9	1.01
38-38.9	1.06
39-39.9	1.11
40-40.9	1.16
41-41.9	1.21
42-42.9	1.26
43-43.9	1.31
44 and above	1.36

Wheeler County

Below 30 gravity	$ .65
30-30.9	.72
31-31.9	.79
32-32.9	.86
33-33.9	.91
34-34.9	.96
35-35.9	1.01
36-36.9	1.06
37-37.9	1.11
38-38.9	1.16
39-39.9	1.21
40-40.9	1.26
41-41.9	1.31
42-42.9	1.36
43-43.9	1.41
44 and above	1.46
Gray County	See gravity table

Humble Oil & Refining Co. and Magnolia Petroleum Co., July 26.

Iatan*	Same as North Texas
Crane-Upton-Crockett, Pecos, Winkler and Glasscock (July 26)‡	$ .65
Chalk†	.80

*Includes Howard County and Westbrook Fields. Marland Refining Co. pays $1.05 for Howard County crude, effective May 21.

†Magnolia Petroleum Co., January 14, 1928.

‡Posted by Humble Oil & Refining Co., Magnolia Petroleum Co. and Gulf Pipe Line Co.

ARKANSAS-NORTH LOUISIANA

Cotton Valley (Below 36 gravity April 11) ..... $ .75
Bellevue (Feb. 27, 1927) 1.25
Urania (Oct. 16, 1928) ..... .90
East El Dorado (March 16, 1927) 1.00
Other fields ..... See gravity table

*Cotton Valley crude above 36 gravity takes same gravity price schedule as shown for North Louisiana and Arkansas crude in Mid-Continent gravity price table.

Note—Cotton Valley and Bellevue, Standard Oil Co. of Louisiana, Louisiana Oil Refining Co., Gulf Refining Co. and Magnolia Petroleum Co.; (Magnolia Petroleum Co. posted Cotton Valley February 8); Urania, Louisiana Oil Refining Corp.; East El Dorado, Magnolia Petroleum Co., Gulf Refining Co.

GULF COAST
(Goose Creek, Hull, Liberty, West Columbia, Orange, Boling, Sour Lake, Humble, Sugarland, Raccoon Bend, High Island, Pierce Junction and Spindletop.)

Grade A (March 14)*	$1.20
Grade B	See gravity table
Jennings, La. (March 14)†	$1.05
Saratoga, Batson, Daytona (March 14, 1927)‡	1.20
Markham (March 14)‡	1.00

*Humble Oil & Refining Co. and other major buyers. †Gulf Pipe Line Co. ‡Sun Pipe Line Co. ‖The Texas Company.

SOUTH CENTRAL AND SOUTHWESTERN TEXAS

Luling (May 5)*	$1.00
Mirando (March 14)†	1.00
Rockdale-Minerva (April 15):	
Below 38 gravity	1.25
38-38.9 gravity	1.27
39-39.9 gravity	1.29
40 and above	1.31
Thrall‡	
Callihan (May 15)	1.75
Lytton Springs (Lockhart)	See gravity table
Somerset	See gravity table

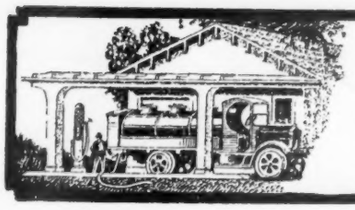
*Posted by Magnolia Petroleum. Thrall prices same as North Central Texas less 19½ cents per cwt. freight.

†Magnolia Petroleum Co., Humble Oil & Refining Co., Crown Central Pipe Line Co.

ROCKY MOUNTAIN STATES
Ohio Oil Co.-Midwest Refining Co.
(Effective July 27, 1928)

Rock Creek, Wyo	$1.33
Salt Creek	See gravity table

(Continued on Page 154)



TANK WAGON MARKETS

Tank wagon quotations for gasoline and kerosene in United States as furnished by the larger marketing concerns Nov. 27.

ALL TANK WAGON AND SERVICE STATION QUOTATIONS INCLUDE TAXES

STANDARD OIL CO. (INDIANA)

	Gasoline			Kero.
	Tank wagon	Service station	Incl'ds tax of	tank wagon
Chicago dist.	15.0	17.0	...	12.0
Decatur, Ill.	15.2	15.0	...	12.1
East St. Louis	14.4	16.4	...	11.2
Joliet	15.4	17.4	...	12.3
Peoria	15.2	14 0	...	12 1
Quincy	15.2	17.2	...	11.9
Davenport, Ia.	18.5	20.5	3.0	12.3
Des Moines	18.5	20.5	3.0	12.3
Keokuk	18.5	20.5	3.0	12.3
Sioux City	18.1	20.1	3.0	11.9
Duluth, Minn.	18.5	20.5	2.0	12.9
Mankato	18.1	20.1	2.0	12.7
Minneapolis	18.2	20.2	2.0	12.9
La Crosse, Wis.	18.2	20.2	2.0	13.0
Milwaukee	17.1	19.1	2.0	11.9
Madison	17.3	17.3	2.0	12.1
Detroit, Mich.	18.8	20.8	3.0	13.7
Grand Rapids	18.7	20.7	3.0	13.6
Saginaw	18.9	20.9	3.0	13.8
Evansville, Ind.	18.0	20.0	3.0	13.0
Fort Wayne	18 4	18.4	3.0	13.4
Indianapolis	18.2	18.2	3.0	13.2
South Bend	18.4	20.4	3.0	13.4
Fargo, N. D.	19.9	21.9	3.0	14.9
Huron, S. D.	20.3	22.3	4.0	13.7
Sioux Falls	19.1	21.1	4.0	13.4
K. C., Mo.*	17.9	17.9	3.0	10.6
Springfield*	17.8	19.8	3.0	11.5
St. Louis*	16.9	16.9	2.5	11.3
St. Joseph*	17 5	17 5	3 0	11 2
Wichita, Kans.	15.8	17.8	2.0	10.8
Bartlesville, Ok.	16.5	18.5	3.0	10.5

*State tax 2 cents; remainder city tax.

NAPHTHA

	Tank wagon	Tank car
Oleum spirits	14.7	12.9
V. M. & P. naphtha	16.2	13.9
Cleaner's naphtha	18.0	14.9
Stanisol	19.0	15.4

Tank wagon prices f.o.b. Chicago; tank car prices f.o.b. Whiting.

STANOLIND FURNACE OIL IN CHICAGO

Less than 100 gallons	9.0
100 to 799 gallons	8.0
800 or more gallons	7.5

Note—Outside Chicago furnace oil discount of 1 cent per gallon is given on deliveries of 100 to 349 gallons and 1½ cents on deliveries of 350 gallons or more.

The following quantity discounts from the service station price are allowed on monthly sales of gasoline; 2,000 gallons or less, 2 cents; more than 2,000 and less than 6,000 gallons, 2½ cents; more than 6,000 gallons, 3 cents. Discounts are allowed each month, and they are not cumulative. Delivery tickets showing date and quantity delivered must be sent to the seller before the tenth of the month to secure the discount on the previous month's purchases.

SOUTHWESTERN DISTRICT

Magnolia Petroleum Co.

	Gasoline			Kero.
	Tank wagon	Service station	Incl'ds tax of	tank wagon
Dallas, Tex.	16.0	20.0	2.0	12.0
Fort Worth	16.0	19.0	2.0	12.0
Houston	16.0	20.0	2.0	15.0
San Antonio	14.0	17.0	3.0	11.0
El Paso	17.0	20.0	2.0	16.0
Texarkana	16.5	20.5	2.0	13.0
Muskogee, Ok.	18.0	20.0	3.0	12.0
Okla. City	18.0	20.0	3.0	12.0
Tulsa	17.0	19.0	3.0	10.0
Ft. Smith, Ark.	18.0	20.0	3.0	14.0
Little Rock	21.0	23.0	5.0	14.0

NEBRASKA

Standard Oil Co. (Nebraska)

	Gasoline			Kero.
	Tank wagon	Service station	Incl'ds tax of	tank wagon
Omaha	17.25	19.25	2.0	12.25
McCook	18.75	20.75	2.0	13.75
Norfolk	17.75	19.75	2.0	12.75
N. Platte	18.75	20.50	2.0	13.50
Scotsbluff	18.75	20.75	2.0	13.25

ROCKY MOUNTAIN DISTRICT

Continental Oil Co.

	Gasoline			Kero.
	Tank wagon	Service station	Incl'ds tax of	tank wagon
Denver, Colo.	19.0	22.0	3.0	14.5
Pueblo	19.0	22.0	3.0	14.5
Grand Junction	22.5	25.5	3.0	18.0
Casper, Wyo.	19.0	22.0	3.0	13.0
Cheyenne	20.0	23.0	3.0	14.5
Butte, Mont.	23.5	26.5	3.0	19.0
Helena	23.5	26.5	3.0	19.0
Salt Lake, Utah	22.0	25.0	3.5	17.0
Albu'que, N. M.	22.0	25.0	3.0	17.0
Boise, Idaho	24.5	27.5	4.0	19.0
Twin Falls	24.5	27.5	4.0	19.0

SOUTHERN DISTRICT

Standard Oil Co. (Kentucky)

	Gasoline			Kero.
	Tank wagon	Service station	Incl'ds tax of	tank wagon
Atlanta, Ga.	22.0	24.0	4.0	16.5
Augusta	22.0	24.0	4.0	15.5
Macon	22.0	24.0	4.0	16.5
Savannah	21.0	21.0	4.0	14.5
Birm'ham, Ala.	22 0	24 0	4 0	16 0
Mobile	22.0	24.0	4.0	15.0
Montgomery	21.0	22.0	4.0	16.5
Clarks'le, Miss.	21.0	23.0	4.0	13.0
Jackson	19.0	21.0	4.0	14.5
Natchez	20.5	22.5	4.0	14.0
Gulfport	22.5	24.5	4.0	14.0
Vicksburg	20.5	22.5	4.0	14.0
Jack'ville, Fla.*	22.0	24.0	5.0	13.5
Miami*	23.0	25.0	5.0	15.5
Pensacola*	24.0	26.0	5.0	13.5
Tampa*	22.0	24.0	5.0	13.5
Lexington, Ky.	21.0	22 0	5 0	16.5
Covington	22.0	22.0	5.0	15.5
Louisville	21.0	23.0	5.0	15.0

*Note—Florida station prices have been 2 cents above tank wagon prices in respective points since July 30 as shown above.

In addition to the state tax of 4 cents on gasoline, Montgomery has city tax of 1 cent on gasoline. Kerosene prices in Georgia include 1-cent tax. In Florida, an inspection fee of 0.125 cent; in Alabama, an inspection fee of one-half cent on kerosene only. Pensacola tax includes 1-cent city levy. Gulf port tax includes privilege tax of 2 cents in addition to state tax.

ATLANTIC COAST DISTRICT

Standard Oil Co. (New Jersey)

	Gasoline			Kero.
	Tank wagon	Service station	Incl'ds tax of	tank wagon
Atlantic City	17.0	20 0	2 0	14 0
Newark, N. J.	17 0	20.0	2.0	14 0
Annapolis, Md.	19.0	22.0	4.0	14 0
Baltimore	19 0	22 0	4 0	11 0
Cumberland	19 0	22 0	4.0	14 0
Washington	17 0	20 0	2 0	14.0
Danville, Va.	20.0	23.0	5 0	14 0
Norfolk	20.0	23 0	5 0	14 0
Petersburg	20 0	23 0	5 0	14 0
Roanoke	20 0	23 0	5.0	14.0
Richmond	20 0	23 0	5.0	14.0
Ch'rlest'n, W. V.	19 0	22.0	4 0	14 0
Keyser	19.0	22 0	4 0	14 0
Parkersburg	19.0	22.0	4 0	14 0
Wheeling	19.0	22.0	4.0	14 0
Charlotte, N. C.	19 0	22 0	4 0	14 0
Hickory	19 0	22 0	4 0	14 0
Mt. Airy	19.0	22 0	4 0	14 0
Salisbury	19.0	22.0	4 0	14 0
Charleston, S.C.	20.0	23.0	5 0	14 0
Columbia	20 0	23 0	5 0	14 0

NEW YORK AND PART OF NEW ENGLAND DISTRICT

Standard Oil Co. (New York)

	Gasoline			Kero.
	Tank wagon	Service station	Incl'ds tax of	tank wagon
Albany, N. Y.	18.0	20.0	...	15.0
New York*	18.0	20.0	...	15.0
Buffalo	18.0	20.0	...	14.0
Rochester	18.0	20.0	...	14.0
Syracuse	18.0	20.0	...	15.0
Boston, Mass.	17.0	18.0	...	15.0
Augusta, Me.	21.0	22.0	4.0	15.0
Manch't'r, N.H.	21.0	22.0	4.0	15.0
Burlington, Vt.	20.0	21.0	4.0	15.0

*Prices in steel barrels.

CENTRAL SOUTH DISTRICT

Standard Oil Co. (Louisiana)

	Gasoline			Kero.
	Tank wagon	Service station	Incl'ds tax of	tank wagon
N. Orleans, La.*	13.5	16.5	3.0	16.0
Baton Rouge	14.0	17.0	2.0	14.5
Alexandria	15.0	18.0	2.0	16.0
LaFayette	15.0	18.0	2.0	15.5
Lake Charles	15.5	18.5	2.0	16.0
Shreveport	15.5	18.5	3.0	15.0
Knoxv'le, Tenn.	17.0	20 0	3 0	16.0
Memphis	17.0	20.0	3.0	15.0
Chattanooga	18.5	21.0	3.0	16.0
Nashville	16 0	19 0	3 0	16 0
Bristol	19.0	22.0	3.0	15.0
Lit. Rock, Ark.	19.0	22.0	3.0	14.0

*Tax of 3 cents includes city tax of 1 cent. Louisiana kerosene prices include 1-cent state tax and 1-cent parish tax.

PACIFIC COAST TERRITORY

Standard Oil Co. (California)

	Gasoline			Kero.
	Tank wagon	Service station	Incl'ds tax of	tank wagon
San Francisco	17.0	21.0	3.0	15.5
Los Angeles	16.5	20.5	3.0	15.5
Reno, Nev.	22.0	26.0	4.0	19.0
Portland, Ore.	17.5	21.5	3.0	16.5
Seattle, Wash.	16.5	20.5	3.0	16.5
Tacoma	16.5	20.5	3.0	16.5
Spokane	20.5	24.5	3.0	20.5
Phoenix, Ariz.	18.0	22.0	4.0	20.5

PENNSYLVANIA-DELAWARE AND PART NEW ENGLAND

The Atlantic Refining Co.

	Gasoline			Kero.
	Tank wagon	Service station	Incl'ds tax of	tank wagon
Pittsburgh, Pa.	16.0	*21.0	...	15.0
Philadelphia	16.0	*21.0	...	15.0
Scranton	16.0	*21.0	...	15.0
Allentown	16.0	*21.0	...	15.0
Altoona	16.0	*21.0	...	15.0
Erie	16.0	*20.0	...	15.0
Philadelphia	16.0	*21.0	...	15.0
Dover, Del.	19.0	21.0	3.0	15.0
Wilmington	19.0	21.0	3.0	15.0
Springf'd, Mass.	18.0	20.0	...	15.0
Worcester	18.0	20.0	...	15.0
Boston	18.0	20.0	...	15.0
Providence, R.I.	20.0	22.0	2.0	15.0
Hartford, Conn.	20.0	22.0	2.0	14.0
New Haven	20.0	22.0	2.0	15.0

*Includes tax of 3.0 cents. Pennsylvania tax is collected by the dealer and paid by him direct to the State.

OHIO

Standard Oil Co. (Ohio)

	Gasoline			Kero.
	Tank wagon	Service station	Incl'ds tax of	tank wagon
All Ohio points	17.0	20.0	3.0	12.0

TANK WAGON CHANGES

November 3—Standard Oil Co. of Kentucky advanced the gasoline tank wagon and station prices 4 cents each in Birmingham, Ala. The previous prices of 18 cents and 20 cents were made effective September 16.

November 19—Standard Oil Co. of Kentucky advanced kerosene 2 cents to 16 cents at Birmingham, Ala. Standard Oil Co. of New York established 17-cent gasoline tank wagon and 18-cent service station prices in New England states. Prices do not include taxes.

November 20—Standard Oil Co. of Kentucky reduced the gasoline station price 1 cent at Lexington, Ky., to 22 cents. Standard Oil Co. of Indiana reduced the gasoline station price to 17.5 cents at St. Joseph, Mo., the same as the tank wagon price. At Peoria, Ill., the same company reduced the gasoline station price to 14 cents.

November 21—Standard Oil Co. of New Jersey made advances and reductions in both the gasoline tank wagon and station prices throughout practically their entire territory, these changes being shown in the accompanying table of prices.

November 26—Standard Oil Co. of Indiana reduced the gasoline station price to 18.2 cents in Indianapolis, Ind. Standard Oil Co. of Louisiana reduced gasoline tank wagon price 2 cents and service station price 1 cent over entire territory, making a 3-cent spread. All discounts to commercial accounts are stopped.

COMPLETE STOCK SALE OF SHREVEPORT COMPANY

SHREVEPORT, La. Nov. 24.—Approval of the proposed acquisition by the Shreveport-El Dorado Pipe Line Co., of the remainder of the stock of the Shreveport Producing & Refining Co., was voted at a meeting of the directors of the two here November 21. The pipe line company already owned the controlling interest in the refining company which it acquired about a year ago.

All that remains for the formal transfer is the signatures on the detailed statement of terms, etc. Included in these terms is an increase of capital stock from 100,000 shares to 200,000 shares and the issue of 39,000 shares of the new stock in exchange for refinery stock on a basis of one share of pipe line for 10 of refinery. Shreveport-El Dorado Pipe Line Co. is owned by Philadelphia interests.

New Jersey Standard Forms Export Co. In New Corporation

NEW YORK, Nov. 26.—The Standard Oil Export Co. made up of five leading Standard of New Jersey units was incorporated today under the laws of Delaware with 100 shares of no-par stock. The incorporation marks the first step towards the organization of an American petroleum industry export corporation under the provisions of the Webb-Pomerene Act. The Standard of New Jersey export company will form the nucleus for an export association taking in the entire industry and will constitute New Jersey's export corporation eligible for membership in the general association when formed.

The units of the New Jersey Export Co. are: Standard of New Jersey, Standard of Louisiana, Humble Oil & Refining Co., Carter Oil Co. and Stanco Distributors, all engaged in export trade.

The officers of the Standard Oil Export Co. are: D. L. Harper, president; W. R. Mook, vice president; C. T. White, secretary; M. H. Eames, assistant secretary; R. P. Resor, treasurer; C. B. Millard and P. Berau, assistant treasurers.

Other leading American oil companies which participated in the recent meeting at which a plan for an export association was broached are expected to follow the lead of Standard of New Jersey and incorporate export companies for membership in the export corporation.

CRUDE OIL PRICES

(Continued from Page 153)

Big Muddy	1.33
Grass Creek, heavy	.90
Grass Creek, light	1.43
Mule Creek (May 1)	1.10
Elk Basin	1.48
Lance Creek	1.48
Poison Spider (March 14, 1927)	1.00
Notches (March 14, 1927)	.65
Rex Lake (February 22)	1.10
Osage	1.48
Lost Soldier (contract)	.95
Hamilton Dome (March 14, 1927)	.85
Greybull-Torchlight	1.48
Cat Creek (Montana)	1.48
Sunburst (Montana) (May 18, 1928)	1.65
Artesia	1.08
Hogback (New Mexico)	1.40

Note—Salt Creek, Osage, Cat Creek, Greybull and Hogback posted by Midwest Refining Co., and the remainder by the Ohio Oil Co. Both companies post Grass Creek light and Elk Basin.

EASTERN STATES

Joseph Seep Purchasing Agent
(Effective November 9, 1928)

Penna Grade Oil in New York Transit Lines (New York)	$3.60
Bradford District Oil in National Transit Lines (Pennsylvania)	3.60
Penna Grade Oil in National Transit Lines (Pennsylvania)	3.50
Penna Crude Oil in Southwest Pennsylvania Lines (West Virginia)	3.50
Penna Grade Oil in Eureka Pipe Line Lines (Pensylvania)	3.40
Penna Grade Oil in Buckeye Pipe Line Lines (Ohio)	3.25
Cabell Grade Oil in Eureka Pipe Line Lines (West Virginia) (July 13)	1.45
Corning 35-cent Grade Oil in Buckeye Pipe Line Co.'s Lines (August 8)	1.70
Corning 25-cent Grade Oil in Buckeye Pipe Line Co.'s lines (August 8)	1.80
Somerset Oil in Cumberland Pipe Line Lines (Kentucky) (Sept. 14, 1928)	1.75
Ragland Grade Oil in Cumberland Pipe Line Lines (Kentucky) (August 1)	.93

MIDDLE WESTERN STATES

Ohio Oil Co.
(Effective July 27, 1928)

Lima	$1.60
Wooster (October 17)	1.77
Illinois	1.55
Indiana	1.37
Princeton	1.55
Plymouth	1.23
Waterloo (November 17, 1926)	1.35
Western Kentucky* (Sept. 17, 1928)	1.60
Saginaw, Mich., Saginaw Sand (February 10)†	1.80
Saginaw, Mich., Berea Sand (February 10)†	1.75
Cumberland, Clay, Barren, Clinton and Monroe Counties, Kentucky, (March 16)‡	1.50
Oil in lines of Stoll Oil Refining Co. in Oil City, Ky. (Oct. 1, 1928)§	1.75
Oil Springs (Canada)¶	2.07
Petrolia (Canada)¶	2.09

*Posted by Ohio Oil Co.
†Posted by Sun Oil Co.
‡Posted by Paragon Development Co.
§Posted by Stoll Oil Refining Co.
¶Posted by Imperial Oil Co., Ltd.

MEXICAN CRUDE

Panuco heavy (f.o.b. Mexican ports)	$1.15

Note—Due to the fact that the exportation of Tuxpam light crude has become a negligible factor, prices will no longer be published.

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Oil Securities Follow Market Upward

Majority of Issues Strong. Curb Market Also Active, Several Showing Fresh Buying Power. Prairie a Feature

By Special Correspondent

The oil group again acted in sympathy with a bull market this week when the majority of issues were strong. The Curb group was also active and many issues on the smaller board showed fresh buying power. Prairie Pipe Line and Prairie Oil & Gas were the features of the Curb, the former selling at 257 and the latter selling at 67½, both of these issues touching new high ground.

Creole Petroleum

Creole Petroleum Corp. stockholders will vote January 8 at the annual meeting on recommendations favoring the adoption of the employe stock ownership plan of Standard Oil Co. of New Jersey, of which Creole is a subsidiary.

E. J. Sadler, president of the Creole corporation, says: "The members of the board of directors of this corporation desire to record their unanimous conviction that the participation by employes of Creole Petroleum Corp. in the third stock acquisition plan will be an important factor in enhancing their interest in and loyalty to this corporation and the general efficiency of the organization and that it will contribute in a substantial degree to the satisfactory relations between management and employes."

Standard of Kentucky

Directors of the Standard Oil Co. of Kentucky have adopted resolutions which will result in reducing the par value of capital stock from $25 to $10 and in payment of a 50 per cent stock dividend on the new $10 par stock. Directors also declared special dividend of 50 cents and regular quarterly dividend of $1, both payable on the present $25 par stock December 31 to stock of record December 15. With approval of these changes the old $25 par shares will be called in as soon after January 1, 1929, as possible, and in their stead will be issued the new $10 par shares on which the 50 per cent stock dividend will be paid.

In addition to changing the par value, directors recommend that stockholders approve an increase in authorized capital from $17,500,000 to $35,000,000.

Standard Oil of Kentucky now has $17,500,000 of $25 par stock authorized, of which 684,120 shares were outstanding at the start of 1928. Reduction in par from $25 to $10 a share will increase outstanding shares to 1,710,300. Payment of a 50 per cent stock dividend on that issue will require issuance of 855,150 additional shares, bringing total outstanding capital to 2,565,450 shares of $10 par. The result of these capital changes will be that for each two shares now held a stockholder will have seven and one-half shares of new $10 stock.

Standard Oil Co. of Kentucky is one of the oldest of the Standard Oil group. It has a large marketing territory through the South, much of which has developed into an all-year gasoline market in recent years.

Rio Grande Oil

Directors of Rio Grande Oil Co. have voted to change capital structure to 2,000,000 no-par shares from 400,000 shares of $25 par value and to issue five shares new stock for each share of present stock outstanding. Rio Grande management is considering application for listing stock on New York Curb Exchange. Matthew C. Brush has been elected a director of Rio Grande Oil Corp.

Shreveport-Eldorado Pipe

Directors of Shreveport-Eldorado Pipe Line Co., Inc., and Shreveport Producing & Refining Co., Inc., met at Shreveport, La., when action was taken looking to merger of two companies. Stockholders of each company will be asked to ratify merger as agreed upon by directors, being one share of pipe line company for 10 shares of refinery stock.

Shreveport-Eldorado Pipe Line Co. proposes to increase authorized capital stock to 200,000 shares from 100,000 shares, of which 39,000 will be required in connection with merger.

Crystal Oil Refining

Net profit of Crystal Oil Refining Corp. in October was $41,038 after interest, depreciation and federal taxes, and for 10 months ended October 31 totaled $264,118. Common stock outstanding amounts to 102,987 shares.

Solar Refining

Stockholders of Solar Refining Co. will consider proposal at annual meeting January 9 to reduce par value of the capital stock to $25 from $100 and increase number of shares to 160,000 from 40,000, or to make such change in par value and number of shares as stockholders may determine.

North Central Texas Oil

Net income of North Central Texas Oil Co., Inc., for quarter ended September 30, 1928, was $61,113 after depletion, including mineral rights, leases, etc., written off, and federal taxes, comparing with $50,621 in preceding quarter and $43,979 in quarter ended March 31. For nine months ended September 30 net income after above charges totaled $115,747. Capital stock consists of 10,000 shares of preferred and 270,000 shares of common.

Standard Oil of Ohio

Standard Oil Co. of Ohio declared regular quarterly dividend of 62½ cents on common, payable January 2 to stock of record December 7.

Independent Oil & Gas

Independent Oil & Gas Co. is offering to stockholders of record November 30 the right to subscribe at $30 a share to additional shares of company's no-par stock, on basis of three and two-thirds new shares for each 10 shares then held. Right to subscribe will expire December 21.

There are 959,457 shares outstanding which will be entitled to subscribe to 351,801 additional shares at the rate mentioned. In case all outstanding 12-year 6 per cent convertible debentures of the company are converted by November 30, and in case all outstanding stock purchase warrants of the company are exercised prior to December 11 next, 223,901 additional shares may be issued to holders of said debentures and stock purchase warrants and they will be entitled to subscribe for 82,097 additional new shares, making maximum number of new shares possibly issuable 433,898. Shares issued pursuant to exercise of stock purchase warrants after November 30 and prior to December 11 will be entitled to subscribe to the new stock at the rate mentioned.

Phillips Dividend

Directors of the Phillips Petroleum Co. on Tuesday of this week voted to pay the regular quarterly dividend of 37½ cents a share and an extra dividend of 50 cents a share on January 2 to stockholders of record December 14. President Frank Phillips stated that while the past year had not been especially good for the oil industry, the Phillips Petroleum Co. has earned more than the present regular and the extra dividend after deductions for depletion and depreciation. He said the company has approximately $30,000,000 in cash and other current assets.

TWENTY REPRESENTATIVE STOCKS

The Oil and Gas Journal weekly average price of 20 representative petroleum stocks listed on the New York Stock Exchange and New York Curb was as follows:

Nov. 26	83.56	Oct. 6	57.55	Aug. 20	65.42
Nov. 19	80.55	Sept. 29	67.93	Aug. 13	65.16
Nov. 12	78.27	Sept. 22	67.12	Aug. 6	66.16
Nov. 5	75.99	Sept. 15	67.06	July 30	64.68
Oct. 29	75.02	Sept. 8	66.76	July 23	64.18
Oct. 20	70.05	Sept. 1	65.96	July 16	64.51
Oct. 13	68.03	Aug. 27	65.79	July 9	65.38

O. T. CRITES DEAD

O. T. Crites, 48, for the past three years a resident of Tulsa, died at his home in that city November 25 after a brief illness. Mr. Crites was a native of West Virginia, and was born in Grafton, that State.

INDEPENDENT OILS ON NEW YORK CURB

Quotations Compiled by Francis, Bro. & Co., Kennedy Building, Tulsa, Okla. Members New York Curb Market

1926 High	1926 Low	1927 High	1927 Low	1928 High	1928 Low	Par value	Stocks	For Week ended November 23 Sales	Open	High	Low	Last	Change
$6 75	.45	2 1/16	.55	1½	.66	$5	Amer. Con. Oilfields	22,900	....	79	71	72	+4
..	..	7½	2¾	9¼	3⅛	N.P.	Amer. Maracaibo	179,900	8¾	9½	8⅜	9¼	— ½
..	..	2¾	1	4½	2¼	$10	Argo Oil	6,600	3	4⅛	2⅜	4	.....
85¼	60	40	20½	55	32⅞	N.P.	British American	No sales.					
28⅜	9¼	28¼	15½	23⅞	12½	25c	Carib. Syndicate (new)	60,700	19⅝	21¾	19⅜	20½	—1⅛
..	..	58¾	40¼	74¾	54	$20	Cities Service	43,700	73	73⅞	72	72⅞	— ¾
..	..	95⅜	87	103½	94½	100	Cities Service, pfd.	1,900	99⅜	99½	99⅛	99⅜	— ¼
..	..	8⅞	7⅜	9⅝	8⅞	10	Cities Service, pfd. B	900	9¼	9¼	9¼	9¼	.....
3½	1¾	3⅞	1⅛	2¼	1 1/16	1	Colombia Syndicate	106	1¼	1½	1¼	1⅜	.....
..	..	9¾	6⅜	8⅛	6½	10	Consolidated Royal	300	6½	6½	6½	6½	..
16	10	14⅞	9½	17½	10	N.P.	Creole Syndicate	18,100	12¼	19⅜	11	12¼	.....
..	..	3	.50	2¾	.76	N.P.	Crown Central	11,700	1¾	1⅞	1⅝	1¾	.....
7⅞	6¾	12	4	31	8½	N.P.	Darby Petroleum	2,200	28	28¾	27	27	—1¾
..	..	2½	.74	2⅛	1	N.P.	Derby Oil & Refining	No sales.					
..	..	16¾	4	21	7½	N.P.	Derby Oil & Refining, pfd.	400	21	21⅛	21	21⅛	...
..	..	2	.40	.53	.15	N.P.	Gilliland ctfs.	No sales.					
98	92	118	86¼	148½	101⅛	$25	Gulf Oil Corp.	42,500	145¼	165	145	157⅞	+13½
$3 00	.83	2½	.80	2¾	1	10	Intercontinental Pet.	70,800	1⅝	2⅜	1½	2⅜	+ ⅜
..	..	2¼	1⅛	3	1¼	N.P.	Kirby Petroleum	10,000	2¼	1¾	1½	1¾	— ¾
12¼	5¾	10⅞	5⅛	9⅜	5⅛	N.P.	Leonard Oil & Dev.	4,300	6	6⅜	6	6	...
27	20	27½	20	40¼	20	N.P.	Lion Oil & Refining	47,200	40	40½	37⅜	39	—1
46	30	59⅜	37	65⅞	49	$25	Lone Star Gas	1,800	64⅝	65	64	64½	...
2⅞	1	2⅞	.80	1⅞	.50	1	Magdalena Syndicate	7,800	....	72	66	66	—4
34	12½	52	12	45	34½	N.P.	Margay Oil	600	36	36	35	36	....
8	5½	12½	5	8	4¼	N.P.	Mexico-Ohio Oil	600	3⅞	3⅞	3¾	3¾	....
1¾	1⅛	1½	1	1½	.81	$1	Mountain & Gulf	10,000	1¼	1¼	1¼	1¼	..
26	23	29¼	22¾	28⅝	21½	10	Mountain Producers	14,000	22¼	24½	21⅜	21⅞	— ⅜
6⅝	5	5⅞	4⅝	5⅝	4¼	5	New Bradford	6,100	4⅝	5	4⅛	4⅞	— ⅛
..	..	16	9¼	11⅜	7⅛	1	New Mex. & Ariz.	4,200	8½	10½	8	9	— ¼
..	..	12¾	9½	13¼	10¾	N.P.	North Central Texas	800	10⅜	10⅜	10	10	— ½
10⅛	5⅞	9⅜	3¼	6	2¼	N.P.	Pandem	7,900	3½	3½	3	3	— ½
12¼	11¾	12⅛	7	15⅝	8½	N.P.	Pantepec Oil	18,600	11	11½	11	11½	.....
22¾	12	13½	5⅛	7¾	5⅛	$10	Pennok Oil	700	6	6½	6	6½	+ ¾
17	8½	24⅜	7	14½	9	25	Red Bank Oil	No sales.					
30¼	12	15½	3½	12⅞	4⅛	N.P.	Reiter-Foster	4,300	9¾	9¾	9⅛	9⅛	— ⅝
7	4½	7	4½	10½	4⅝	N.P.	Ryan Consolidated	20,900	8⅞	10¾	8⅝	10¾	+1¾
10	7⅛	8	5¼	7¼	5¾	$10	Salt Creek Cons.	100	5¾	5¾	5¾	5¾	— ¼
35	24⅛	35½	27¼	35	23¼	10	Salt Creek Prod.	10,200	26⅛	26⅞	25½	25⅞	— ⅛
6⅞	1¼	7	1¼	3½	1	5	Savoy Oil	No sales.					
27	7⅝	26½	17	22⅞	13	10	Tidal Osage	1,900	16⅞	17¼	16	17	+ ⅛
25¾	7⅝	23¾	15	21¼	13⅛	10	Tidal Osage, nonvoting	2,700	15½	16¾	15½	16	+ ½
92	63½	92	63½	90⅞	75	100	Transcontinental, pfd.	300	91⅞	91⅞	90½	91⅞	+2⅛
8	4½	7⅝	4¼	8¼	4⅞	5	Venezuelan Petrol	38,700	7	8	6⅝	7⅝	+ ⅝
8⅛	5½	8	4¾	8¼	4⅞	$1	Woodley Petroleum	No sales.					
6½	6	6	1¾	8⅜	2⅛	25	Y Oil & Gas (new)	11,800	5⅜	7¾	5⅛	6	+ ¾

*Ex-dividend.

TRANSACTIONS IN OIL SHARES ON NEW YORK STOCK EXCHANGE

Quotations Compiled by Francis, Bro. & Co., Members New York Stock Exchange, Kennedy Building, Tulsa, Okla.

1926 High	1926 Low	1927 High	1927 Low	1928 High	1928 Low	Listed capital	Par value	Stocks—	Div. rate	Last paid	Transactions week ended November 23 Sales	Open	High	Low	Last	Change
32⅞	24¼	37⅝	27⅝	40¾	27⅛	(sh) 922,075	N.P.	Amerada Corp.	50cQ	Oct. 31, 28	75,100	40	43⅞	40	43⅛	+ 3¼
74	39⅞	82½	35⅛	85	51¼	(sh) 209,180	N.P.	American Republics Corp.	.....	.....	16,300	74⅞	74⅞	71⅝	72⅛	— 2½
60	44⅜	50¼	35	53⅜	37½	$56,000,000	$25	Associated Oil	50cQ	Sept. 29, 28	160		48	47	48	+ 1
128⅜	97	131⅜	104	239⅝	95¾	50,000,000	25	Atlantic Refining	25cQ	Sept. 15, 28	98,900	55⅛	55¾	53⅝	53⅞	— 1⅜
33½	23½	35½	20¾	53	20	28,725,675	25	Barnsdall Corp. A	50cQ	Oct. 31, 28	118,100	47⅛	48⅞	46⅜	47⅛	— ⅞
94¼	50	96¾	65	94⅞	68	20,785,400	100	General Asphalt	.....	.....	37,400	74½	81⅞	74½	81½	+ 7
72	50¼	175⅜	60⅛	167	119	25,000,000	100	Houston Oil	.....	.....	4,600	137	139	132½	132½	— 4½
34	19⅝	32¾	17⅝	37½	21¾	(sh) 500,000	N.P.	Independent Oil & Gas	37½cQ	Oct. 31, 28	70,700	37½	38⅜	35⅝	35¾	— 1⅝
12¾	7½	12⅛	7⅝	39⅝	9	$3,280,340	$10	Indian Refining	.....	May 31, 24	84,900	34¾	37¾	32	37⅝	+ 3
25⅞	16½	37¾	20½	39⅛	27⅝	(sh) 3,992,122	N.P.	Lago Oil & Transport	.....	May 1, 27	6,300	34	35¾	34	35⅜	+ 1⅜
19⅞	12	18⅛	10	19¾	9⅜	(sh) 1,237,078	N.P.	Louisiana Oil Refining	.....	.....	36,400	17¼	18¼	17	17¼	+ ⅛
28	16½	22¾	12	25½	12½	(sh) 330,000	N.P.	Maracaibo Oil	.....	.....	3,800	19	19⅞	18¾	19¼	— ⅝
63⅜	49¼	58½	31	47⅜	33	(sh) 2,316,692	N.P.	Marland Oil Co.	.....	Mar. 31, 27	165,200	45½	49¾	45¼	48⅝	+ 2½
13¾	6	9¼	3	70	4⅝	(sh) 945,939	N.P.	Mexican Seaboard	.....	Dec. 15, 20	157,600	60¼	68	60¼	66½	— 1½
37	20½	39⅜	25½	40⅞	25⅛	(sh) 1,357,461	N.P.	Mid-Continent Petroleum	.....	Aug. 1, 27	231,100	38¾	44¼	38½	44	+ 5
104¼	90	105	97	115⅛	103¼	$6,718,000	$100	Mid-Continent Petroleum pfd.	$1.75Q	Sept. 1, 28	No sales					
2½	½	3¾	1⅝	7⅜	2⅜	24,298,850	10	Middle States	.....	July 1, 23	22,800	6	6⅛	5¾	6	— ¼
76½	56⅛	65⅞	40⅛	55	38¼	$48,807,400	$50	Pan American P. & T.	.....	Oct. 20, 27	11,100	52⅛	55½	52	53¼	+ 1⅜
78⅜	56⅞	66⅜	40¼	58⅞	37¾	121,097,900	50	Pan American P. & T. B	.....	Nov. 15, 24	142,400	55⅜	58⅞	54¼	56⅞	+ 1⅞
46	30	37⅞	16¾	28⅜	15½	(sh) 400,000	N.P.	Pan American Western B	.....	Jan. 30, 27	1,500	18½	19	18	18	— ½
32	4½	18⅞	8	21¾	11½	(sh) 198,770	N.P.	Panhandle P. & R.	.....	.....	3,900	15½	15¾	15	15½	..
99⅜	51	83	54	106¼	70	$2,935,200	$100	Panhandle P. & R. pfd.	.....	July 2, 23	1,100	....	84	80¾	80¾	— 9¼
57⅜	40	60¼	36¼	50¾	35¼	(sh) 2,406,796	N.P.	Phillips Petroleum	37½cQ	Oct. 1, 28	131,600	50⅞	53⅞	50¾	52½	+ 2
....	....	1⅜	½	5¼	½	$29,622,925	$25	Pierce Oil Corp.	.....	.....	10,300	3⅛	3¼	3	3	— ¼
7	2¼	5½	2½	6⅝	3½	(sh) 2,500,000	N.P.	Pierce Petroleum	.....	.....	8,500	5¾	6¼	5¾	6	+ ⅛
20¾	11	33⅞	16¾	28⅝	16	$37,450,850	$50	Producers & Refiners	.....	Sept. 15, 23	10,800	28⅞	28⅞	27	27	— 2
41¾	30⅜	50	36⅞	49⅝	41	2,845,350	50	Producers & Refiners pfd.	.....	May 1, 25	330	46⅞	47¼	45⅜	47¼	+ ¼
31	25¼	33½	25	28½	19	75,959,350	25	Pure Oil Co.	25cQ	Dec. 1, 28	1,877	28⅞	31¼	28½	30	+ 1½
27½	22	28⅝	25⅝	56	23½	$29,224,894	$25	Richfield Oil	.....	Oct. 20, 27	106,600	53⅝	55	55¼	53	— ½
57⅜	47⅜	54½	44¼	63⅜	44⅝	(sh) 611,303	13.40	Royal Dutch, N. Y. shares	$1.879	Aug. 3, 28	7,000	62	63⅛	61¼	62¾	+ ¾
48⅝	40½	47⅞	41⅜	57½	40⅝	(sh) 77,590	£2	Shell Transport & T.	$1.455	July 23, 28	No sales					
31	24	31¾	24⅝	37½	23¼	(sh) 10,000,000	N.P.	Shell Union Oil	35cQ	Sept. 30, 28	523,500	37¾	39¼	37½	38	+ ½
28⅝	15⅛	26⅜	14¼	27¼	18⅛	$7,208,080	$10	Simms Petroleum	.....	Apr. 1, 27	.....	27⅛	.....	.....	.....	.....
24⅞	16¾	22⅜	15	45¾	17⅜	(sh) 4,501,915	N.P.	Sinclair Consolidated	.....	.....	471,900	44	46¼	42½	45⅛	+ ⅝
99½	90	104½	97	110	102½	$16,604,600	$100	Sinclair Consolidated pfd.	$2Q	Aug. 15, 28	600	109	109	108½	109	.....
37⅛	26⅝	37⅜	24⅛	41⅜	25	27,396,590	25	Skelly Oil Co.	50cQ	Sept. 15, 28	56,800	41⅞	42⅝	40½	40¾	— ⅜
63⅝	51½	60¾	50⅜	69¼	53	(sh) 13,016,434	N.P.	Standard Oil of California	65½cQ	Sept. 15, 28	210,500	69⅛	78½	68½	78½	+ 8½
46⅜	37½	41⅜	35⅛	54⅜	37¾	$607,910,525	$25	Standard Oil of New Jersey	25cQ	Sept. 15, 28	109,000	54⅛	54¾	52⅞	53⅜	— ½
47¼	30⅜	34⅛	29¾	41½	28¾	427,973,275	25	Standard Oil of New York	40cQ	Sept. 15, 28	301,200	38⅞	39¾	38⅛	39¼	+ ½
41⅝	30⅛	34⅞	30	74⅞	31½	(sh) 1,206,073	N.P.	Sun Oil	25cQ	Sept. 15, 28	8,400	73½	74¾	72½	73⅞	+ ⅜
5¼	1	6½	3⅛	12⅜	2½	(sh) 1,121,368	N.P.	Superior Oil Corp.	.....	Dec. 20, 20	432,000	10⅝	14	10½	13¾	+ 2¾
58	48	58	45	74⅜	50	$180,480,550	$25	The Texas Corporation	75cQ	Oct. 1, 28	166,300	73¾	74⅜	68½	68¾	— 5¼
19½	12	18⅞	12	26⅝	12½	8,380,340	10	Texas Pacific Coal & Oil	.....	Jan. 3, 28	78,200	22¼	25⅜	21	23¼	+ ¾
39¼	27	29⅛	19	36	19⅝	(sh) 2,168,410	N.P.	Tide Water Oil Co.	20cQ	Sept. 29, 28	8,800	34¼	35½	33⅝	34	— ⅛
103	87¼	90⅛	85	96	86	$20,705,200	$100	Tide Water Oil Co. 5% pfd.	$1.25Q	Nov. 15, 28	1,300	95¼	95½	94¾	94¾	— ⅛
27	20⅞	19⅛	15⅜	25	14⅜	(sh) 4,796,158	N.P.	Tide Water Associated	.....	Aug. 1, 27	120,200	23¼	24¼	22⅜	23⅛	.....
5½	3	10⅜	3⅜	12	7¼	(sh) 3,742,029	N.P.	Transcontinental Oil	.....	.....	391,100	11½	14⅜	11½	13¼	+ 2
58⅜	37¼	56½	39⅝	57	42¾	$40,791,225	$25	Union Oil of California	50cQ	Nov. 10, 28	61,400	54½	58	53⅜	55½	+ 1
120⅜	84¼	127½	94	128⅛	116⅜	30,844,000	100	Union Tank Car Co.	$1.25Q	Sept. 1, 28	100	118	118	118	118	— 4
30⅛	23½	34½	24½	44⅞	26	(sh) 310,956	N.P.	Warner Quinlan	50cQ	Oct. 1, 28	25,200	42¾	42⅞	41⅝	42	— 1¼
29¾	25⅛	27½	20	35⅝	20⅛	(sh) 490,000	N.P.	White Eagle Oil & Refining	50cQ	Oct. 20, 28	33,200	34⅜	35	34¼	34⅜	— ¼
								Wilcox Oil & Gas	.....		1,200	21⅝	22	21¼	21¼	— ¾

*Odd lots. ‡Also extras.

STANDARD OIL STOCKS ON NEW YORK CURB

21	16	21⅝	17⅞	22⅜	16¾	£4,126,460	£1	Anglo-American Oil	24.4c	June 6, 28	5,800	18¼	19	18¼	19	+½
..	..	3¾	¾	5	1¼	(sh) 500,000	N.P.	Atlantic Lobos	.....	.....	500	2¾	2¾	2½	2½	.....
76	65	69	50	56	45½	1,000,000	25	Borne Scrymser	$18.A.	Oct. 15, 28	No sales.					
59½	42	60	45	76	53	10,000,000	50	Buckeye Pipe Line	$1Q	Sept. 15, 28	100	69¾	69¾	69¾	69¾	+¾
82½	65	126	76½	161	117¼	3,000,000	25	Chesebrough Mfg.	$1Q	Sept. 29, 28	1,600	145½	150	145¼	150	.....
25⅞	17½	22⅝	16¼	23	16	36,057,840	10	Continental Oil	.....	Dec. 15, 27	37,500	19⅞	20	19⅜	19⅜	—¼
137	102	137	89	114	88	3,000,000	100	Cumberland Pipe Line	$2Q	Sept. 15, 28	No sales.					
63¾	43	68½	47	88	64⅛	5,000,000	100	Eureka Pipe Line	$1Q	Nov. 1, 28	100	70	75½	70	75½	—4
32½	9⅞	13½	3½	12	5	16,000,000	100	Galena Signal Oil	.....	June 30, 25	300	7¼	7¼	7⅛	7⅛	—⅜
68⅛	52	68½	54	110¼	60	73,117,577	25	Humble Oil & Refining	30cQ	Oct. 1, 28	45,400	111⅞	114¼	106½	110⅞	—1¼
144½	125½	182	123¾	264	176½	20,000,000	100	Illinois Pipe Line	$68.A.	June 15, 28	7,300	256	259	255	258	—1
..	..	64¾	37¾	104	56¾	(sh) 6,458,267	N.P.	Imperial of Canada	25cQ	Sept. 1, 28	8,300	94	95	89½	91	—3½
72½	58	94½	61	91⅞	74⅞	$5,000,000	$50	Indiana Pipe Line	$1Q	Nov. 15, 28	1,600	83⅝	92¾	82⅞	92¾	+9¼
35½	28¾	39	28¼	55	35	(sh) 17,123,444	N.P.	International Petroleum	25c	June 30, 28	33,900	51	51	48½	49	—1½
20¾	12½	24	13½	32⅜	20⅛	$6,363,350	12.50	National Transit Co.	25cQ	Sept. 15, 28	4,800	24⅞	24⅞	22½	23½	—1⅝
51½	27¼	44½	31¼	75	37½	5,000,000	100	New York Transit	.....	July 15, 26	200	70	70¼	70	70¼	+¼
80½	64	100	70	125	62	4,000,000	100	Northern Pipe Line	$38.A.	July 1, 28	100	63¼	63¼	63¼	63¼	+¼
67⅜	55¾	67⅞	52	76	58	60,000,000	25	Ohio Oil Co.	50cQ	Sept. 15, 28	29,400	76½	78½	72¾	75¾	—¼
24¾	15	39	12	44	29	10,000,000	25	Penn Mex. Fuel	$1.25	May 31, 28	1,500	38½	38¾	38	38	—1
137½	122½	190	132	236	172	81,000,000	100	Prairie Pipe Line	$3.50	Oct. 31, 28	9,870	218¾	247	216	247	+28¼
60¼	48	55½	45⅝	56¾	46	60,000,000	25	Prairie Oil & Gas	.....	Aug. 31, 27	141,700	54¾	65½	54¼	64⅜	+9¾
220	84½	201½	175½	212	167	4,000,000	100	Solar Refining	$58.A.	June 20, 28	50	212	212	212	212	—3
74½	61½	27¼	15½	35⅞	12	5,000,000	50	Southern Pipe Line	$2	Dec. 1, 27	1,600	15	18¾	15	18¾	.....
50	34½	41½	35	68⅞	36¾	2,000,000	25	South Penn Oil	50cQ	Sept. 29, 28	22,800	69	69	67½	67½	—1½
56	47½	83	55½	100	70	3,500,000	100	Southwest Pa. Pine Lines	$1Q	July 2, 28	350	84¼	85½	80	80½	.....
70½	60½	81½	64⅝	87⅞	70⅞	228,415,463	25	Standard Oil of Indiana	62½Q	Sept. 15, 28	117,600	87⅜	95⅞	86½	90¾	+3⅜
36½	16½	20⅞	14⅝	27¾	15	8,000,000	25	Standard Oil of Kansas	.....	June 16, 24	2,700	23	27⅞	22½	22½	+½
134⅜	108	130	111½	174⅛	122¼	17,012,559	25	Standard Oil of Kentucky	$1Q	Sept. 29, 28	16,900	174	179¾	170	176⅞	+2⅝
51⅛	42	49½	40	51⅞	39⅞	4,559,850	25	Standard Oil of Nebraska	63cQ	Sept. 20, 28	3,400	50½	54⅝	50	52¼	+1¾
372	288	87½	72	111½	71	14,000,000	25	Standard Oil of Ohio	62½cQ	Sept. 1, 28	2,200	107	107	103	103¼	+5¼
21	15	21	14½	26	16	30,734,000	25	Swan Finch Co.	.....	Nov. 1, 19	No sales.					
109⅜	90¼	..	..	93½	72¼	124,941,600	25	Vacuum Oil	75cQ	Sept. 20, 28	24,800	99⅞	101¼	96	98⅝	—⅞

PROTEST FLOOD PLAN SUBMERGING GAS FIELD

MONROE, La., Nov. 24.—First steps for the protection of the oil and gas interests in the eastern half of Louisiana from the Arkansas line to the Gulf against destruction by the execution of the Jadwin flood control plan were taken in Monroe, November 21 when operators in the Monroe and Richland Fields, carbon companies, pipe lines and others met at the call of the Louisiana-Arkansas division of the Mid-Continent Oil and Gas Association. Many of these operators, not being familiar with details of the Jadwin plan, were unaware that it threatens the existence, by subjecting them to periodical overflow, of the entire Richland Parish gas fields with its tremendous potentialities, part of the Monroe Field and all of the prospective wildcat territory in the eastern part of the State, including the salt dome country south of Red River. Also, the pipe lines serving an unnumbered host of domestic and industrial consumers in five states.

This conference resulted in the appointment of C. H. Hoff, of the Palmer Corp. of Shreveport, as chairman of the general committee, and adoption of a schedule of work in gathering and compiling facts and statistics to be presented to Congress in seeking relief from the destructive effects of the Jadwin plan. A committee on valuation of oil and gas lands will estimate the extent of their probable damage.

Technical Questions Answered

BY CHARLES K. FRANCIS, PH.D., TECHNICAL EDITOR

This department of The Oil and Gas Journal is devoted to the manufacturing branches of the oil industry.

Those connected with the refining of crude petroleum, the manufacture of natural gasoline and closely allied industries are invited to submit their problems to Dr. C. K. Francis, technical editor. The department was created for the purpose of aiding managers, superintendents, engineers, chemists and all those engaged in the various phases of plant operation; also those connected with the marketing and utilization of petroleum products.

Questions should be submitted in as much detail as possible so as to assure a satisfactory answer.

All inquiries should be signed and if other than the given initials are to be used please indicate the desired letters.

Questions involving patented processes, intricate formulas and calculations and estimates of costs, for obvious reasons, cannot be answered. The replies will appear on this page within a reasonable time.

CARDS FOR SHIPMENTS OF ACID

We are notified that the cards marked —ACID—as required by the I.C.C. regulations should be replaced by a card on which CORROSIVE LIQUID is used in place of the word acid. Does this mean that the "acid" cards cannot be used on shipments of acid?—P. C. E.

This question, or at least a very similar question, was answered recently by the Bureau of Explosives in the Accident Bulletin No. 82, and the reply made there is given below:

Under the I.C.C. regulations, as now, amended, the acid placard is obsolete. Instead, a similar placard bearing the words, "corrosive liquid" is used in its place. This arrangement was made due to the fact that there were many liquids which are highly corrosive and which nevertheless are not acid. Caustic soda would be an example of this. Paragraph 915 permits the use until further notice of "acid" placard complying with the regulations in effect prior to November 1, 1927.

The corrosive liquid placard referred to above is illustrated in Paragraph 912 of the I.C.C. Regulations, as amended effective November 1, 1927. This placard is intended to supersede the acid placard previously shown in the paragraph of the Regulations. The reason for this step is that a number of corrosive liquids, such as caustic soda, etc., are shipped which are not acid at all and it was felt to be inconsistent to place acid label on such shipments.

BLENDING GASOLINE

Is the following calculation true for the mixing of lower and higher recovery natural gasoline?

$$\text{Total c. c. of mix} = \frac{(\text{gals} \times \text{recovery}) + (\text{gals} \times \text{recovery})}{\text{Total gallons}} = \text{Total mix recovery gravity.—E. D.}$$

The statement of this formula appears to be somewhat involved and it would have been clearer if an example had been submitted. This is a modification of the common barrels formula for determining the gravity of a proposed mixture of two oils or a mixture of the heavier gasolines, as outlined on this page June 17, 1926.

There are numerous forms for outlining the calculation that may be made for the purpose of estimating the gravity of a blend of two oils. Difficulties frequently arise because a formula may have been devised for one set of conditions and an effort is made to apply it to others. It should be noted that the extreme gravities, as expressed by the A.P.I. scale, cannot be used in calculations of this kind when accurate results are required. Therefore, when exact results are desired, the A.P.I. gravities should be converted to specific gravities before making the calculation.

If gallons are multiplied by gravity of one lot plus gallons multiplied by gravity of the other and this sum is divided by the total volume, the result will be the approximate gravity of the mixture. The unit of volume must remain the same; that is gallons, quarts, barrels.

VAPOR PHASE CRACKING GAS PRODUCTION

In the operation of vapor phase cracking plants what is the usual percentage of fixed gases and what is the gasoline recovery per 1,000 cubic feet from such gases?—G. D. H.

There are so many conditions under which oil is cracked in the vapor phase that it is difficult to agree on what process would represent the usual condition. The vapor phase process has been considered especially adapted for the manufacture of certain kinds of gas from oil. The cracking temperature may vary from about 750 degrees Fahrenheit to approximately 2,000 degrees Fahrenheit, the larger quantities of gas being formed at the higher temperatures. The tower surface and condensing conditions, including temperature, have much to do with the gas volume and the quantity of gasoline which may be contained in the gas.

A general statement may be ventured. The percentages of gas will probably vary, under different conditions, from 10 to 25 per cent. The gasoline content from half a gallon per 1,000 cubic feet to 12 gallons.

SCREEN FOR PRODUCING WELLS

Will you kindly tell me when the first screen casing for oil wells was made with an oxyacetylene torch and how it was made?—G. W. M.

We are not certain about what is wanted here. There are several forms of screens which you will find described in Day's Handbook of the Petroleum Industry, Volume 1, page 298; Deep Well Drilling, by Jeffery, page 494, and Technical Paper 247, United States Bureau of Mines, Perforated Casing and Screen Pipe in Oil Wells, by E. W. Wagy.

The button screen is used in a great number of wells in California. The buttons are usually made of noncorrosive metal with horizontal slots. The common method is to thread these and then screw them into the pipe so that the surfaces will be flush with the pipe.

We suggest that you write to the Layne & Bowler Corp., Los Angeles, Calif. We feel confident that they are familiar with the history of well screens in California and may be prepared to give you the details as to when and how the first screens were made with an acetylene torch.

CATALYSTS FOR SYNTHETIC MOTOR FUELS

What are the catalytic substances used in the hydrogenation of coal and pitch for making motor fuels? It appears that the ordinary substances, such as iron, nickel, copper, platinum, and others would not be satisfactory because of the sulphur present.—A. F. D.

The usual catalysts are poisoned by sulphur and are not employed in the coal processes. An excellent outline of the conditions was given by Professor Hugel, as reported in Automotive Industries, Vol. 59, page 693, 1928, from which the following is abstracted.

The high pressure hydrogenation process of Bergius is applicable to coal and pitch. By destructive distillation of coke oven pitch yields approximately 44 per cent of liquids. This same pitch, when hydrogenated by the Bergius process, becomes transformed into a tar containing 57.5 per cent of liquid products. Hydrogenation thus results in a material gain.

M. Hugel conceived the idea of utilizing the alkaline hydrates ad the alkaline earths, such as sodium hydrate, potassium hydrate, calcium hydrate, etc., as catalyzers. The special constitution of these hydrates and the fact that they begin to dissociate at temperatures only slightly above their temperature of formation, gave reason for the hope that they would form excellent accelerators of hydrogenation.

It is possible to hydrogenate naphthaline in the presence of sodium hydrate under a pressure on the hydrogen of 150-300 pounds per square inch and at temperatures of 450-480 degrees Fahrenheit. Hydrogenation of anthracene is equally easy. Moreover, the catalytic activity of the hydrates is not diminished by the presence of impurities and poisons. It seemed a good plan to apply these catalysts to such materials as pitch, which cannot be purified.

Hydrogenation of pitch takes place under pressures of 1,100-1,400 pounds per square inch at temperatures of 575 degrees Fahrenheit in the presence of from 7 to 10 per cent of catalytic material. There is obtained a highly fluorescent greenish liquid, in addition to black solid substance. Under these conditions the yield of liquids does not exceed 30 per cent, as a result of the catalyzer becoming ineffective. M. Hugel has looked for the cause of this neutralization of the catalytic effect, and he ascribes it to the colloidal nature of the pitch. After following out this supposition, M. Hugel succeeded in modifying his method in such a way as to obtain a yield of 80 per cent.

HYDROGENATION OF COAL PROCESSES

There are several methods proposed for making oil from coal and I want to ask if you can furnish an outline of the important ones?—G. E. S.

You will find mention of these processes on page 56 of the October, 18, 1928, issue of The Oil and Gas Journal, by G. A. Burrell, from which the following is taken.

Rapid strides are being made in the preparation of motor fuels from coal by hydrogenation, either of the coal itself (Bergius process) or of carbon monoxide. Water gas (CO and H_2) is made to combine in the presence of various catalysts with or without pressure. Processes in active stages of development are in Germany the Bergius process (pressure hydrogenation of coal); the I.G. Farbenindustrie Co.'s process (pressure hydrogenation of coal with a catalyst); the Fischer-Tropsch process (CO_2+H_2+a catalyst with or without pressure); in France the Patart process (CO_2+H_2+a catalyst+high pressure); the Audibert process ($CO+H_2$+a catlyst+pressure); and the Nash process in England ($CO+H_2$+a catalyst). It is doubtful, however, if at the present moment any considerable quantity of fuel is being made commercially in Germany, where three different groups are actively working on the problem, and where a large Bergius plant has been built, or in France where the problem engages the attention of another group, but is a development that may cause the export gasoline trade of the United States some uneasiness within the next five years.

The Standard Oil Co. of New Jersey considers the matter important enough that it has secured rights to use the Bergius process in this country. There is every indication that Germany and France are striving through their scientists to make themselves independent of foreign supplies of petroleum by developing synthetic motor fuels and lubricants.

Motor fuel can be made from coal, particularly by low temperature carbonization methods, but although much work has been done on the subject in recent years and many plants of a large or small size have been built, there are no outstanding successful processes in operation, at least from the standpoint of supplying a considerable amount of motor fuel. Coke, motor fuel, gas and tar are the products produced and a market must be at hand for all of them.

GREEN SAND FOR SOFTENING WATER

What is the material called "Green Sand" which is offered for treating boiler water? Is this a chemical substance or a mined material?—G. M. L.

Green sand is a natural zeolite mineral, mined and especially prepared for use as a water softening medium.

Physically it is granular in character, similar to coarse sand, of a dark green color and weighs about 90 pounds per cubic foot.

Chemically it is a sodium aluminum silicate, not soluble in water or in weak acid or alkaline solutions, and has the property of exchanging its chemical base. This gives it its water softening properties. In operation its sodium (salt content) is exchanged for calcium, magnesium, or other hardening ingredients thus removing the hardness from water. This action is reversible which makes it possible to regenerate the mineral with a common salt (sodium chloride) solution, so that green sand may be used again and again indefinitely for softening water.

Green sand is rapid in action and regeneration. It will not discolor the water and will produce zero soft water up to the limit of its capacity, 3,400 grains per cubic foot of mineral. For regeneration its salt consumption is lower than that of synthetic zeolites, requiring only 2 per cent to the weight of mineral or about 1¾ pounds of common salt per cubic foot of mineral. It can be regenerated an indefinite number of times and requires no replenishment.

OKLAHOMA FIELDS

(Continued from Page 40)

17-7. Markham Oil Co. made location for No. 7 Beesley, NE cor. SE NW, Section 20-17-7, Drumright Field. Twin State Oil Co. has the rig up for No. 5 Coachman, SW cor. NW NE, Section 20-17-7. The rig is on the ground for No. 6 Coachman, NW cor. SW NE, Section 20-17-7. Hall & Donnelly's rig is up to deepen No. 1 Johnson, NE cor. SE NW, Section 17-14-10.

F. A. Havel and others' No. 1-A Ramsey, NE cor. SE, Section 10-14-10, is rigging up to deepen from 3,194 feet. Wilcox Oil & Gas Co. and others moved a machine to the location for No. 8 Anthis, CSL NW SW, Section 1-16-11. Ogg Petroleum Co. has the rig up for No. 1-A Smith, SE cor. NW SW, Section 35-16-9. Roach and others' No. 3 Beavers, SE cor. NW NW, Section 35-18-9, is a rig. Curtis Oil Co. has built the rig for No. 1 Adams, NW cor. Section 15-18-9.

C. H. Lebow's No. 16 Tiger, SW cor. NE NW, Section 17-17-7, Drumright Field, has been completed for 165 bbls. in sand at 2,726-44 feet. Shaffer Oil & Refining Co.'s No. 18 Tiger, NE cor. SW NW, Section 17-17-7, made 125 bbls. from sand at 2,702-33 feet. The Prairie Oil & Gas Co.'s No. 5 Coachman, NE cor. NW, Section 20-17-7, was completed for 129 bbls. in sand at 2,658-2,718 feet. Houston Oil Co.'s No. 2 Bullett, NW cor. SE NE, Section 20-17-7, made 240 bbls. from sand at 2,783-2,810 feet.

Dixie Drilling Co.'s No. 2 Pahcohney, C SE NW, Section 28-18-11, an old well deepened, has been abandoned at 2,492 feet in Wilcox sand. A. B. Ice and others' No. 1 Johnson, NW cor. SE SW, Section 28-18-11, is dry and abandoned at 2,355 feet in Wilcox sand. J. E. Wallace's No. 1 McComos, CWL NW NW, Section 2-17-11, made 2,000,000 feet of gas from Dutcher sand at 1,970-82 feet. Sapulpa Fuel Co.'s No. 1 Glover, C SE NE, Section 6-17-11, is dry and abandoned at 2,357 feet. Sinclair Oil & Gas Co.'s No. 1 Morton, NW cor. SW SE, Section 27-14-10, has been abandoned at 3,623 feet.

Caddo County

Magnolia Petroleum Co.'s No. 3 Moss, NE cor. NW SW, Section 5-5-9w, made 10 bbls. from sand at 2,408-18 feet.

Comanche County

Magnolia Petroleum Co.'s No. 2 Price, SE cor. SW NE, Section 30-2-9w, was completed for 7 bbls. in granite wash at 2,138-50 feet.

Cotton County

G. E. Crane's No. 1 Sturgeon, C NW NE, Section 33-2s-9w, is dry and abandoned at 3,505 feet.

Grady County

Oklahoma Gas Utilities Co.'s No. 14 Farwell, SW cor. NW SW, Section 26-5-8w, made 17,000,000 feet of gas from sands at 2,002-2,350 feet.

Grant County

Argo Oil Co.'s No. 2 Swaggart, SE cor. Section 15-27-3w, Deer Creek Field, was completed for 25 bbls. after drilling to 4,274 feet and then plugging back to 3,995 feet.

Jefferson County

Dye & Fritz' No. 1 Barrett, C SE SE, Section 5-6s-7w, has been abandoned at 2,269 feet.

Kay County

C. A. Leonard and H. A. G. Oil Co.'s No. 3 Binney, C NW SW, Section 21-27-1, is rigging up for a shallow gas test.

Kiowa County

Bridwell and others' No. 1 Foster, SE cor. NW, Section 18-6-16w, is drilling at 20 feet.

Lincoln County

Texas Pacific Coal & Oil Co.'s No. 3 Long, SW cor. NE SE, Section 31-17-5, is pumping 12 bbls. from sand at 4,181-4,214 feet.

Muskogee County

Bryan & Emery moved a machine to the location for No. 5 Barnett, CWL SE NE, Section 8-15-15. R. & R. Drilling Co. has a machine on the location for No. 1 Ragan, NE cor. Section 19-13-16. C. D. Bradley's No. 1 Cordrey, NE cor. SE NE, Section 21-15-19, is dry and abandoned at 1,078 feet. Tidal Oil Co.'s No. 1 Brady, NW cor. NE NE, Section 3-14-18, is dry and abandoned at 1,202 feet. A. Wasaff's No. 3 Henson, NE cor. SW SE SW, Section 32-14-19, has been abandoned at 1,515 feet.

Okfuskee County

Minnehoma Oil Co. made location for No. 1 Fixico, NW cor. SW SE, Section 29-12-10. Atlantic Oil Producing Co. has the rig on the ground for No. 1 Field, NW cor. Section 13-10-11. Devonian Oil Co. moved a machine to the location for No. 5 Fier, C SW NE, Section 11-10-11. Atlantic Oil Producing Co. has the rig up for No. 1 Micco, NW cor. SW SW, Section 12-10-11.

Champlin Oil & Refining Co.'s No. 11 Jacobs, SW cor. SE SE, Section 15-11-11, has been completed for 300 bbls. in Wilcox sand at 3,458-85 feet. W. L. Umbrum's No. 5 Simmer, CSL N half NE SE, Section 11-10-11, made a 75-bbl. well in Booch sand at 2,009-38 feet. Atlantic Oil Producing Co.'s No. 2 Robinson, CWL NW SW, Section 12-10-11, made 75 bbls. from Salt sand at 1,650-1,700 feet and Booch sand at 2,016-27 feet. F. D. Misener's No. 1 Bird, NW cor. NE, Section 21-10-11, is dry and abandoned at 1,712 feet in Salt sand.

Okmulgee County

Winemiller Oil Corp. has a machine on the location for No. 1 Warren, SW cor. NE, Section 13-14-11. Sidwell Drilling Co.'s No. 3 Lunsford, NE cor. SW SW, Section 4-14-11, is drilling at 425 feet. W. B. Pine's No. 1 Doyle, NE cor. SE NW, Section 18-15-13, is a rig on the ground. A. G. Hazlett has a machine on the location for No. 6 Tucker, SE cor. NW SE, Section 2-13-14.

A. G. Hazlett and others' No. 1-A Haskins, CNL SW SW, Section 27-16-12, is dry and abandoned at 2,600 feet. L. C. Wheeler and others' No. 1-A Cornelius, SW cor. NE NE, Section 35-15-12, has been completed for 5,000,000 feet of gas in Dutcher sand at 2,194-2,270 feet after plugging back from Wilcox sand at 2,760 feet. W. C. Newman and Atlantic Oil Producing Co.'s No. 1 Kemp, SE cor. NW, Section 8-13-11, is dry and abandoned at 3,291 feet in Wilcox sand. J. L. Brock and others' No. 1 Holleyman, SE cor. NW, Section 25-13-12, is a dry hole at 3,052 feet.

Moffett and others' No. 7 Hawkins, CSL SW NE, Section 6-11-12, has been abandoned at 2,350 feet. Kirkland & Son's No. 1 Dyle, C SW NE, Section 19-15-13, is dry and abandoned at 2,216 feet. No. 3 Phillips, SE cor. NW, Section 19-15-13, was completed for 12 bbls. in sand at 1,550-1,630 feet. Devonian Oil Co.'s No. 1-A Campbell, NE cor. NW NW, Section 19-15-14, is dry and abandoned at 2,471 feet. Unger Brothers' No. 2 Sells, CNL NW NE, Section 25-15-14, is dry and abandoned at 2,310 feet.

Osage County

The Prairie Oil & Gas Co. made location for No. 1, SE cor. NE, Section 21-25-6.

A. M. Barbour made location for No. 1, NW cor. NE NE, Section 32-23-9. Silurian Oil Co. made location for No. 5, SE cor. NW SE, Section 12-23-11. Location was made for No. 53, SE cor. SW NE, Section 17-23-12. Tidal Oil Co. made location for No. 1, NE cor. NW SW, Section 29-21-11.

Bement Oil Corp.'s No. 6, NE cor. SW SE, Section 10-25-8, is dry and abandoned at 1,014 feet. Peters Petroleum Co.'s No. 1, NE cor. SE SE, Section 8-21-9, is dry and abandoned at 435 feet. Clint Moore Estate's No. 17, SE cor. SW SW, Section 9-21-9, made 20 bbls. from sand at 281-99 feet.

Pawnee County

Operators Oil Co. moved a machine to the location for No. 1 Powell, SE cor. NE NW, Section 15-20-9. Hemlock Oil Co.'s No. 1 Williams, NE cor. Section 8-20-9, is a machine. Mowry, Welch & Carson's No. 1 Rogers, SW cor. NW, Section 15-21-7, is dry and abandoned at 2,911 feet. Thompson & Black's No. 2 Lennex, NW cor. SW SW, Section 14-20-9, has been completed for 1,500,000 feet of gas in Layton sand at 926-60 feet.

Stephens County

Pace and others' No. 1 Bush, NE cor. NW, Section 3-2s-8w, is preparing to deepen from 1,688 feet. Mudge Oil Co. made location for No. 1 Grace, C SW, Section 15-1s-5w. Magnolia Petroleum Co. is erecting the rig for No. 5 Worrell, NW cor. NE NW, Section 19-1s-8w.

Atlantic Oil Producing Co.'s No. 1 Taylor, SW cor. NW, Section 12-1s-4w, is making 268 bbls. from sands at 3,079-3,604 feet.

Payne County

Producers & Refiners Corp.'s No. 1-B Goss, NW cor. SE SW, Section 7-18-5, has been completed for 50 bbls. in sand at 2,802-23 feet.

Tulsa County

S. W. Anthony's No. 3 Whetstone, NW cor. NE SW, Section 3-16-12, has been completed for 2,000,000 feet of gas in Dutcher sand at 1,917-27 feet.

Pontotoc County

Westheimer & Daube moved the rig out for No. 8 Wade, SE cor. NW SE, Section 19-5-8, Allen Pool. La Salle Oil Co. is erecting the rig for No. 2 Mole, NW cor. SE SE SE, Section 30-5-5. Westheimer & Daube made location for No. 1 Harmmer, NE cor. NW, Section 12-4-7. No. 1 Bussby, NW cor. Section 4-4-8, is a machine.

Westheimer & Daube's No. 6 Wade, NW cor. SE, Section 19-5-8, Allen Pool, swabbed 600 bbls. from sand at 2,582-2,646 feet. Shell Petroleum Corp.'s No. 1 Oliver, SW cor. SE NW, Section 32-5-7, has been shut in for 17,000,000 feet of gas in sand at 2,710-3,002 feet. Superior Oil Corp. and Ogg's No. 2 Boy, NW cor. SE NW, Section 32-5-5, made 120 bbls. from Simpson sand at 2,523-2,664 feet. American Oil & Refining Co.'s No. 2 Brown, SW cor. NW SE, Section 27-5-6, has been abandoned at 1,924 feet.

Pottawatomie County

Sinclair Oil & Gas Co. is erecting the rig for No. 1 Lewis, NW cor. SW SW, Section 6-8-5, Maud area. Independent Oil & Gas Co.'s No. 9 Knapp, NW cor. NE, Section 8-9-5, is rigging up. Sinclair Oil & Gas Co. made location for No. 5 Bellars, SW cor. NW NE, Section 19-8-5. Phillips Petroleum Co. made location for No. 1 Wallace, SW cor. NW SW, Section 17-8-5. Skelly Oil Co. and Margay Oil Co.'s No. 1 Linger, SW cor. NW NE, Section 18-8-5, is rigging up.

Magnolia Petroleum Co. has the rig up for No. 2 Billington, NW cor. NE SW, Section 8-8-5. No. 1 Billington, NW cor. SW, Section 8-8-5, is also a rig. The Texas Company has dug the cellar for No. 1 Calvin, NE cor. SE, Section 7-8-5. Pure Oil Co. is building the rig for No. 1 Wiley, SE cor. NW, Section 7-8-5. Gypsy Oil Co. has the rig up for No. 2 Bourassa, NE cor. Section 7-8-5. Phillips Petroleum Co. made location for No. 2 Keenan, SW cor. SE, Section 6-8-5.

Blackwell Oil & Gas Co.'s No. 1 Lewis, SW cor. NE, Section 24-7-4, St. Louis Pool, is drilling deeper at 4,435 feet. Tidal Oil Co. is building the rig for No. 3 Smith, NE cor. SW SE, Section 26-7-4. Magnolia Petroleum Co. is erecting the rig for No. 4 Cherry, CNL SE NE, Section 26-7-4. No. 3 Cherry, NE cor. SW NE, Section 26-7-4, is also a rig under construction. Interocean Oil Co. made location for No. 2 Coley, SE cor. NE SE, Section 24-7-4. Magnolia Petroleum Co. made location for No. 2 G. W. Fyke "B," SW cor. NW SE, Section 20-7-5.

The Texas Company's No. 1 Cherry, SW cor. NW NW, Section 25-7-4, St. Louis Pool, made 4,780 bbls. from Wilcox sand at 4,230-60 feet. McCulloch Oil Co.'s No. 5 Bruno, SW cor. SE NE, Section 25-7-4, swabbed 847 bbls. from Simpson sand at 4,196-98 feet. Sinclair Oil & Gas Co.'s No. 7 Kitch-ee, SW cor. NW SW, Section 19-7-5, has been completed for 360 bbls. in Simpson sand at 4,140-85 feet. Magnolia Petroleum Co.'s No. 4 C. A. Youts, NW cor. NE SW, Section 19-7-5, swabbed 404 bbls. from Simpson sand at 4,145-4,255 feet. Gypsy Oil Co.'s No. 7 Stahl, NE cor. SE NE, Section 30-7-5, made a 72-bbl. well from Simpson sand at 4,332 feet after plugging off the Wilcox sand.

No. 3 Stahl, SW cor. SE NE, Section 30-7-5, pumped 70 bbls. from Simpson sand after plugging back from 4,504 feet to 4,495 feet. No. 1 Johnson, NW cor. SE NW, Section 19-7-5, drilled to 4,461 feet in Wilcox sand and plugged back to 4,547 feet where it swabbed 120 bbls. The Prairie Oil & Gas Co.'s No. 3 Gammon, NW cor. SE NW, Section 30-7-5, made 410 bbls. from Simpson sand at 4,165-80 feet. Independent Oil & Gas Co. and others' No. 1 Alfrey, SW cor. NE, Section 7-9-5, Earlsboro Pool, is dry and abandoned at 4,362 feet in Wilcox sand. Sinclair Oil & Gas Co.'s No. 1 Kah-dot, SW cor. NW NW, Section 21-7-5, is dry and abandoned at 4,765 feet.

Seminole County

Sinclair Oil & Gas Co. has the rig on the ground for No. 5 Nakotche, SW cor. NE SW, Section 18-5-8, Allen Pool. The Prairie Oil & Gas Co. is moving in the rig for No. 1 Mitchell, NE cor. SE NE, Section 15-8-5. Red Bank Oil Co. has the cellar dug for No. 3 Sango, SW cor. NE NE, Section 1-9-5, Earlsboro Pool. Magnolia Petroleum Co. is building the rig for No. 1 Carr, NE cor. SW, Section 30-9-6. Gypsy Oil Co. is erecting the rig for No. 1 Cozad, SW cor. Section 27-7-6, Little River Pool. T. B. Slick is building the rig for No. 2 Wood, NW cor. NE SW, Section 26-7-6. Mid-Continent Petroleum Corp. is building the rig for No. 3 Harjo, Section 14-5-7. No. 2 Harjo, NE cor. SE NE, Section 14-5-7, is being deepened from 2,591 feet and now drilling at 2,600 feet.

Louisiana Oil Refining Corp.'s No. 4 Punluste, SE cor. SW SW, Section 8-5-8, Allen Pool, is pumping 50 bbls. from Cromwell sand at 2,611-85 feet. Gilcrease Oil Co.'s No. 2 Riverbed, SW cor. NW NW, Section 17-5-8, swabbed 490 bbls. from Cromwell sand at 2,620-90 feet. Magnolia Petroleum Co.'s No. 2 Reed, NE cor. SW NW, Section 17-5-8, swabbed 330 bbls. from Cromwell sand at 2,655 feet after plugging back from 2,796 feet.

Indian Territory Illuminating Oil Co.'s No. 3 Fleet, NW cor. SE SW, Section 18-5-8, Allen Pool, was completed for 435 bbls. in Gilcrease sand at 2,499-2,516 feet. T. B. Slick and Skelly Oil Co.'s No. 1 Campbell, SE cor. NW, Section 6-9-3, Earlsboro Pool, was completed for 3,115 bbls. in Wilcox sand at 4,332-70 feet. Magnolia Petroleum Co.'s No. 8 Hammond, NW cor. NE, Section 10-8-6, swabbed 100 bbls. from Wilcox sand at 4,450-4,503 feet.

Indian Territory Illuminating Oil Co.'s No. 1 Lawyer, SE cor. NW, Section 26-8-6, is dry and abandoned at 5,055 feet in Wilcox sand. Empire Oil & Gas Co.'s No. 1 Harjo, SW cor. NW SE, Section 17-7-6, Little River Pool, is dry and abandoned at 4,605 feet in Wilcox sand. Carter Oil Co.'s No. 3 Moore, NE cor. NW, Section 11-7-6, has been abandoned at 4,613 feet. The Prairie Oil & Gas Co.'s No. 4 Harris, NW cor. NE SW, Section 14-7-6, Little River Pool, made 450 bbls. from Wilcox sand at 4,240-47 feet.

Wagoner County

J. P. Duke and others' No. 1 Brown, NE cor. SW NW, Section 36-16-17, was completed for 3,500,000 feet of gas in sand at 832-50 feet.

GEORGE DYE PINS FAITH TO HARD KNOCKS

(Continued from Page 29)

any superstitions in this particular, they may be boiled down to just this, that good luck is the copartner of hard work and that without hard work good luck isn't worth three whoops in a rain barrel. Whether he was delivering telegrams at 2 cents each; running a bicycle race, with a dazzling sweater as the prize; handling the throttle of a passenger train, with hundreds of lives in his keeping, or helping to operate a big oil company, Mr. Dye put his heart into the job.

A man trusting in luck would not have applied himself to mastery of technical phases of oil production as Mr. Dye did. It was his regular practice for years after he had left the railroad to put in long hours at night poring over books on petroleum geology, engineering, petroleum and corporation law, etc. Many a time when he came home tired from work in the field, if he had surrendered to a very natural impulse he would have read the evening paper for a while after dinner and then snoozed in his easy chair till bedtime. But ignoring consid-

erations of comfort, he got out his books and resumed packing petroleum facts into his head.

And They Stayed There

As a result he can talk today about metamorphosed rocks as sources of oil, capillary retention of petroleum in unconsolidated sands, statutory regulation as to plugging or filling abandoned wells, or gas-oil ratio as related to the decline of oil production with the same facility that he would display in discussing the block system as a safety measure on railroads or the bicycle as an aid in the expeditious delivery of telegrams.

The Wilcox company was among the first, if not actually the first, to utilize the motor truck in the oil field in transporting pipe and equipment. It bought its first one in 1917. Mr. Wilcox and Mr. Dye devoted hours of thought and discussion to one problem in connection with the new truck. They believed that on account of its being so much higher than a horse-drawn wagonbed some appliance would have to be devised to load pipe onto it. After much work with pencil and paper and several consultations with Frank Hinderliter, who later was to become widely known as a manufacturer of oil field tools, they designed a hoisting apparatus which they conceded would not only solve the loading problem, but would stand as an enduring monument to their inventive genius.

Too Bad There's No Picture of It

The two men got the Oil Well Supply Co. to build one of the things from sketches they provided. It was a marvelous contrivance, apparently combining features of a block and tackle, a Roman catapult and a stiff-legged derrick, with ingenious little accessories. The new truck was being broken in at the company's property near Bixby. Proudly the president and vice president sent their hoist out to be used in loading pipe on the truck.

A day or two later Mr. Wilcox and Mr. Dye rode out to see their epochal machine in operation. On the way they admitted to each other that they had done a clever piece of work, which was destined to have a large place in oil field transportation thereafter.

Arriving at the railroad siding at Bixby where casing was being loaded for removal to the lease, they found a crew of workmen rolling the big pipe onto the truck with ordinary skids, such as were used in team hauling. The men weren't having the smallest trouble, one joint of casing after another being pushed into place with speed and precision. The hoist—the invention to produce which they had given lavishly of their time and talent—was nowhere in sight. The two inventors looked at each other and simultaneously agreed that they'd be damned.

Seemed to Have Lost Interest

"Well, what became of your hoist?" Mr. Dye was asked recently.

"Don't know, don't care," was the answer. "We didn't ask where it was and we never saw it again."

In 1908 Mr. Dye married Miss Nena Langdon of Eldred, Pa. They have three children and they have resided in Tulsa since 1916.

Although Mr. Dye harbors no secret longing to return to the engine cab and hold the throttle again, as former railroad engineers are supposed to do, he does enjoy meeting his old railroad associates. In April, 1927, Mr. Dye was one of a group of Mid-Continent oil men on their way to New York on the New York Central's Twentieth Century Limited to attend a conference on curtailment of production. When the train stopped in Cleveland Mr. Dye was observed walking up the station platform to the locomotive, where he engaged in animated conversation with a knot of railroad men.

When the incident was commented on later Mr. Dye explained, "Why, I just went up there to see if there was anybody I knew and I found that Two-Step Tommy is the engineer of this train. Thomas Gage is his real name, but he's Two-Step Tommy to all his friends because of a peculiarity in his gait. I used to work in the same cab with him."

GEORGE H. JONES SUCCUMBS TO AILMENT

(Continued from Page 26)

to Carthage to take counsel with his father as to what he should do when the Oswego business college received a letter from the National Transit Co. at Oil City, Pa., at that time a subsidiary of the Standard Oil Co., asking if there was a particularly promising young man who wanted a good job paying $50 a month. The proprietor forwarded the inquiry to Mr. Jones, who in a short time presented himself at the Transit offices in Oil City to begin work. This was in 1890. Mr. Jones little suspected that he was placing his foot upon the lowermost rung of a steep and difficult ladder, which 35 years later would give him entrance to one of the most important board rooms in the country and the right to sit there at the chairman's desk.

Surprised Employer

The head of the telegraph department of the National Transit Co., Mr. Splane, had considerable correspondence to do by telegraph and letter. It was his practice to dictate his communications to a clerk in his own abbreviated system of longhand, who afterwards wrote them out in his best Spencerian style for signature. Mr. Splane had none too much confidence in his new employe and insisted on dictating all of his mail the first day to both men. He was not a little surprised when Mr. Jones returned much before the other man and laid down a neat stack of typewritten letters. The regular amanuensis was promptly relieved from that work and Mr. Jones became the entire "stenographic department" of the Oil City office. Also Mr. Splane changed his mind about the salary, which he made $60 in place of the $50 offered.

There followed seven industrious, happy years, marked by two important developments. The first of these was Mr. Jones' marriage to Miss Blanche K. Fry, and the second was his determination to go on with his education by taking up the study of law. This work all had to be done at night at home without the assistance of lecturers. However, M. F. Elliott, afterward general counsel in New York, and Henry McSweeney took an interest in the clerk's desire to learn his Blackstone and gave him help. More important was the friendship which Mr. Elliott formed for him and which proved of the greatest assistance in later years. Mr. Jones completed his studies by working night after night until it was almost time for the gray dawn to shame his kerosene lamp, and in 1892 was registered in Franklin. However, he had no real desire then or later to practice as an attorney, and he never did.

In 1897 he was transferred to the Pittsburgh office of the same company, where he had no time for further study. His daily program was diligent application at bookkeeping and accounting tasks until the closing hour, at which time he was called into the manager's office and given a day's accumulated correspondence, amounting to from 30 to 40 letters each night. This meant that he had to remain until close to midnight. How long he might have stood up under this strain it forunately was not necessary to discover, for two years later he was brought to New York as secretary to Daniel O'Day, prominent Standard Oil official.

While in this position Mr. Jones discovered the need for more complete and accurate records of pipe-line activities than had ever been compiled, and with his own hands he made up a remarkable series of maps and charts. Furthermore, he filed this information away in a card-index memory so that it was rarely necessary for him to go to his files when any question arose. His progress in subsequent years was slow but always in a straight line ahead. He was constantly increasing his knowledge of intricate details of the oil business and coming more and more to the attention of the executives who chanced to come into contact with him. One result was that when Congress made its investigation of the oil industry, which was followed by the filing of the antimonopoly suit, making it necessary for the Standard Oil Co. to set up a good-sized department for the preparation of the defense, Mr. Jones was promptly made a part of that force. Efforts were made to have him become a regular member of the legal staff, but he preferred not to become a lawyer. In the same period he began to familiarize himself with the details of the natural gas business. When the late A. C. Bedford became a director of the Standard Oil Co. of New Jersey in 1907 and took over these properties, Mr. Jones began an intimate association which continued until Mr. Bedford's death. The direction of the gas companies' affairs fell to him when Mr. Bedford was again promoted.

Mr. Jones became a director of the Standard Oil Co. of New Jersey on April 18, 1917, with the entry of the United States into the World War. He was elected treasurer on August 2, 1919, and a vice president on December 27, 1920. Following the death of A. C. Bedford, Mr. Jones was elected chairman of the board in November, 1925. An interesting phase of Mr. Jones' career was that he followed Mr. Bedford in practically all of the latter's positions, moving up step by step, virtually in the tracks of his close friend and associate.

Mr. Jones was 56 years of age, 38 years having been spent with the Standard Oil Co. of New Jersey or subsidiaries.

His home was in Pelham, N. Y., where also reside his two married daughters. He had three young grandchildren.

GEORGE H. JONES NEVER FORGOT HIS HOME TOWN

The following editorial anent the death of George H. Jones, chairman of the board of directors of the Standard Oil Co. of New Jersey, appeared in the Oil City Derrick, of Oil City, Pa.

While leaders in the oil world are mourning the death of George H. Jones, who, as chairman of the board of directors of the Standard Oil Co. of New Jersey, was entitled to rank among the greatest in petroleum circles, Oil City residents are touched with sorrow for the passing of a man who, in his rise to one of the highest positions in the world, never forgot his former city or the friends he made here.

The advancement of Mr. Jones on the ladder to fame was as spectacular, as rapid and as awe-inspiring as any in the history of a great democratic nation and powerful industries. His father, who was a veteran of the Civil War, made his living as a carpenter despite the loss of a leg. Few boys had to work as early in life or as hard as George Jones. Books were a luxury in his early home but he made arrangements for the borrowing of them. He worked at any task which came to his attention. He sorted rags for the picker in a mill, swept up litter, ran errands and worked in a chair factory at Carthage, N. Y. Thirty-five cents a day was his pay. Such was the beginning of business life for the lad who later was to become one of the greatest figures in the second largest industry and a personage whose decisions carried weight all over the world.

Mr. Jones' real start was made in Oil City and many of his most intimate friends were located here. He had applied and been accepted for stenographic work in the office of the late W. W. Splane here. So well did he do his task that his first pay check from an oil company called for $60 a month instead of the $50 at which he had been engaged. During the seven years' apprenticeship which he served for the Standard Oil Co. in Oil City he made a foundation for himself which served him well during the later years when he was struggling to the front.

From 1890 to 1897 Mr. Jones was located here, but he always remembered the city and was always a friend to those with whom he had worked more than three decades ago. Two great events marked his seven years' residence here. One was his determination to take up the study of law, which culminated in his registration before the bar at Franklin. The other was his marriage to Miss Blanche K. Fry of this city.

No matter how many pressing business matters were before him, Mr. Jones always found time to welcome an Oil City resident to his offices at 26 Broadway. He always had a genuine smile for the men who toiled with him in clerical positions in the old National Transit Building and a few questions as to the welfare of those in whom he was especially interested in the "home town."

The business world will long remember Mr. Jones for his remarkable accomplishments, for his extraordinary memory, for his clever analysis of tremendous problems and for his management of a great concern in such a way that there has never been a scandal of any nature connected with it under his leadership.

Business men will also recall his great character. He never sought to put himself to the front, he abhorred self-praise and newspaper men found him the hardest to interview concerning himself of any of the great in the nation. He was always a hard worker and was always thinking of the best interests of the company which he directed. These traits made him a favorite with oil men everywhere.

Oil City will never forget Mr. Jones, the man who, despite great business cares, always thought of his former friends, never forgot their names and was always pleased to see those with whom he had labored in the days when he was merely one of many seeking advancement in the oil industry.

SCIENTISTS DISCUSS COAL AND PETROLEUM

(Continued from Page 28)

between demand and the present oversupplies in many fields.

Even in America, he said, the new possibilities in coal, such as the manufacture of synthetic fertilizer, alcohol and gasoline, would prove attractive to the American financier "in spite of the fact that he is wading in natural oil."

He believes capital employed in chemical plants in adding hydrogen to carbon compounds would enjoy a better annual turnover than capital invested in power stations. This would imply a complete change in the coal trade the world over, Dr. Zur Nedden said.

Oil and British Empire

Any serious shortage in petroleum in the United States which produces 75 per cent of the world's petroleum output would seriously affect the British Empire, R. H. Crozier, manager, Mineral Oils Extraction, Ltd., London, said in a paper on "Low Temperature Distillation, the British Coal Industry and Oil Supplies." After discussing all sources of petroleum within the British Empire, Crozier said that 70 per cent of British petroleum needs are met by importation, the United States being the most important source of supply.

"It is evident, therefore," he said, "that any decrease in the United States oil production would be quickly reflected by a shortage and higher prices for oil products in British countries. We have within British territories ample supplies of raw materials from which the bulk of our oil requirements may be extracted by distillation. The average yield of such materials would be considerably under 1 bbl. of oil per ton. It is evident, therefore, that to make good any considerable percentage of our present consumption would involve the treatment of millions of tons of coal or oil shales every year and the creation of a new industry of unprecented magnitude, the development of which must be undertaken without delay if we are to be in a position to meet the inevitable shortage when it comes."

Mr. Crozier was positive that the oil shortage referred to would come, and went into a semitechnical discussion of carbonization methods to prepare for the shortage.

Doctor Rittman described a process by which true coal is being produced from petroleum. This coal is only a by-product but it is being profitably marketed

in the West, where it is being made in an oil refinery incidental to the manufacture of gasoline from petroleum refuse. Doctor Rittman predicted that within the next year literally hundreds of millions of cubic feet of natural gas originating in Texas, Montana and other states will be delivered to the Midwest pipe lines. This method already is being employed in the Southwest, Doctor Rittman said.

Doctor Rittman stated that the Skelly Oil Co. is planning to provide facilities to convert its crude petroleum entirely into gasoline with the manufacture of some coal as a by-product, adding that "with the combination of the processes I have indicated it by no means would be difficult to visualize a plant capable of converting the crude petroleum entirely into gasoline."

"The first question which naturally arises is: Is it commercial? For a period of months the plant in question has been manufacturing some 50 tons a day of the material. Facilities are being provided to increase this to 100 tons a day, with plans under way to increase considerably that output."

For Home Building

"There is another use for coal by-products, and that is building of homes," declared Gustav Egloff, director of research, Universal Oil Products Co., Chicago, and his assistant, Dr. J. C. Morrell, in a joint paper.

"When I walk down a street and see block after block of buildings, dull brown or gray color, the thought comes to me 'why can't we build polychromatic homes?' and the answer comes immediately 'we can,' " Egloff said. "The material is in commercial use. Chemically it is hexatetramethylamine. To get it, we take the high boiling tar acids obtained by processing coal and crack them to form carbolic acid. To this we add formaldehyde and ammonia to obtain the material. Add iron oxide and you get a red material. Add titanium oxide and the resultant color is a beautiful blue. Other dyes and colors may be added, single or in combination, to obtain the desired colored effect.

"This material is impervious to water, highly resistant to atmospheric corrosion, is an electric nonconductor and can be produced cheaper than the granite now used to veneer high steel buildings. In my opinion, it is more satisfactory material."

In a summary of tests in automobile fuels held under the supervision of official representatives of the Automobile Club of France recently, A. Guiselin, secretary general, International Petroleum Commission, predicted that the problem of substitution of other fuels for gasoline will be met by the production of "pulverulent carbon."

Briquets of lignite, he reported, were successfully used as fuel in the test. "The very fact," he said, "that for 21 days an auto generator functioned with these raw briquets shows that the path leading to the carburation of automobile motors by means of raw carbon, under appropriate form, is now open to a vast number of products such as those resulting from convenient carbonization of bituminous coals, lignites, peat and wood."

"It is no longer worth while," he insisted, "to try to liquefy coals and lignites, but to give them reactive properties by proper process of carburation, freeing at the same time special carbon adapted to automobile generators and rich gases."

Among Those Present

Among the representatives of the oil industry present at the Second International Bituminous Coal Conference were the following: Raymond L. Abel, Petroleum Refining Department, School of Mines, University of Pittsburgh; Gosse Lain Allard, mining engineer, Industrie de Petrole, Brussells; George S. Davison, president, Gulf Refining Co., Pittsburgh; Harry C. Donaldson, Jr., chemist, Atlantic Refining Co., Pittsburgh; Dr. A. E. Dunstan, chief chemist, Anglo-Persian Oil Co., Ltd., London; Dr. Gustav Egloff, Universal Oil Products Co., Chicago; E. B. Fulks, vice president, American Creosoting Co., Louisville, Ky.; Harley S. Gibbs, University of Pittsburgh; H. B. Graham, Gulf Refining Co., Pittsburgh; Charles E. Hemminger, Standard Oil Co. of Indiana; William Higburg, Republic Creosoting Co., Indianapolis, Ind.; T. J. Hilliard, Waverly Oil Works, Pittsburgh; Harold P. Kiehl, Atlantic Refining Co., Pittsburgh; Harold B. Horner, Republic Creosoting Co., Indianapolis, Ind.; Franklin E. Knoch, Continental Oil Co., Florence, Colo.; Colonel Lindemann, Anglo-Persian Oil Co., London, England; William Robert Martin, South Penn Oil Co., Mannington, W. Va.; Dr. Jacques C. Morrell, Universal Oil Products Co., Chicago, Ill.; Ransom E. Somers, Gulf Oil Co., Pittsburgh; Henry A. Spiegelman, Atlantic Refining Co., Pittsburgh; Walter C. Teagle, Standard Oil Co. of New Jersey, New York; Paul Weaver, Gulf Refining Co., Houston, Tex.; R. M. Welker, Gulf Refining Co., Pittsburgh; Walter E. Winship, president, Chalmette Petroleum Corp.

ELWOOD AND KETTLEMAN ARE UNIQUE FIELDS

(Continued from Page 27)

which these correlations were checked.

The Vaqueros sand existing in the Elwood Field consists of a soft, rather even grained sandstone with occasional hard layers. It is quite porous, tests indicating a porosity of about 28 per cent. Its thickness in nearby exposures is approximately 350 feet. Immediately under the Vaqueros sand is found the Sespe formation of red, brown, gray and greenish shales and hard sands and sandstones approximating 3,000 feet in thickness. The log and core record of the Barnsdall's No. 1 Edwards, 5 miles west, shows about 47 per cent, or 1,400 feet of this formation as sand or sandstone and in the first 1,000 feet of the formation about 460 feet in sand or sandstone. Although a large part of this Sespe sandstone is relatively hard, it is porous and exceptionally well adapted to serve as a reservoir for oil and consequently its sand zones are potential deeper oil horizons in the Elwood Field.

Approximately 100 acres has been proven as highly productive in the Elwood Field, and it is estimated a minimum of 300 acres will ultimately be found productive. It seems reasonable to expect a total productive area of approximately 600 acres or more. This estimate is based only on the area located on land and does not contemplate the extensive area believed to exist beyond the tideline. The Barnsdall has priority rights on tideland drilling permits, and even if this area, located beneath the ocean, is never drilled the drainage factor is of considerable importance as it should add greatly to the life of wells located on land and increase their total ultimate recovery. It is impossible to estimate the total possible ultimate production of the Elwood Field because of the limited amount of information yet available. None of the three wells completed affords any basis for work, as no decline curves are yet available. No. 1 Bell has produced 315,511 bbls. during its initial 116 days, and its current production is less than 50 bbls. per day below its initial output. The gas pressure remained very consistent and a check indicates no apparent decrease. Some idea of a reasonable expectation of production per acre may be obtained by the saturation method. Assuming that the Vaqueros oil sand has a porosity of 25 per cent and the zones of sand are 350 feet thick, the saturation complete and the ultimate recovery 30 per cent of the oil, computation indicates a recovery per acre of 210,000 bbls. This would seem to be a conservative estimate judging from the performance of the first three wells finished. This estimated recovery of 210,000 bbls. per acre covers the Vaqueros sand only and does not include the potentialities of the underlying Sespe formation.

The Kettleman Hills Field of Kings County looks as though it will be one of the largest and most important districts discovered in California. This field is expected to be at least 5 miles in length and should be prolific if the discovery well is any criterion of the productivity of the Vaqueros oil sand. The Milham's No. 1 Elliott required four gas traps to handle its output of natural gas, which has a theoretical gasoline content of 4 gallons for each 1,000 feet. The crude oil production of this discovery well, 4,000 bbls. daily, tests 60.5 degrees and has a gasoline content in excess of 60 per cent. Additional development work has already get under way at Kettleman Hills, where the Standard, Marland and Milham oil companies own in fee and control large leases.

OHIO COMPANY COMBINES 3 ABSORPTION PLANTS

(Continued from Page 151)

its 21 small compression plants have a rated capacity of 6,300 gallons daily. Thirteen compression plants in the Robinson district have a capacity of 3,300 gallons daily and in the Casey division four plants have a capacity of 1,300 gallons daily. The same company has a 6,000-gallon compression plant at Grass Creek, Wyo., and in the Lance Creek, Wyo., Field a 4,900-gallon plant.

The Mid-Kansas Oil & Gas Co., which is a subsidiary of the Ohio Oil Co., has four gasoline plants. The plants and daily capacity are: Burbank, Okla., 4,500 gallons; Eliasville, Tex., 7,500 gallons; Desdemona, Tex., 1,700 gallons, and Caddo, Tex., 6,300 gallons. The Mid-Kansas plants are of the oil absorption type. The 50 plants of the Ohio company, including the Mid-Kansas, have a rated capacity of 73,500 gallons daily.

PANHANDLE FIELDS

(Continued from Page 35)

Spencer was dry and abandoned at 879 feet. Holbrook & Wood's No. 1 Davis-B made 15 bbls. at 890-96 feet and was drilled to a total depth of 899 feet. Magnolia Petroleum Co.'s No. 5 Johnson made 4 bbls. at 595-600 feet. Petroleum Production Co.'s No. 8 Henning made 30 bbls. at 1,087-96 feet. Prairie Oil & Gas Co.'s No. 3 Campbell was dry and abandoned at 1,050 feet. Riggs and others' No. 2 McKinley was dry and abandoned at 575 feet.

Montague County

Bridwell Oil Co.'s No. 1 Howard-B was dry and abandoned at 1,824 feet. Gwenn & Murphy's No. 1 Hinton made 8,000,000 feet of gas at 825-32 feet. Pure Oil Co.'s No. 8 Keck-A made 17½ bbls. at 809-25 feet.

Wichita County

Magnolia Petroleum Co.'s No. 12 Warren made 15 bbls. at 780-86 feet, was drilled to a total depth of 791 feet, and plugged back to 789 feet. Hammon & Garrett's No. 15 McCarty-B made 2 bbls. at 519-32 feet. Their No. 1 McCarty-D made 55 bbls. at 1,335-70 feet. Hobbs Henry's No. 3 Watkins made 30 bbls. at 1,522-23 feet. Holbrook & Wood's No. 25 Kemp & Kempner made 32 bbls. at 1,196-1,203 feet. Magnolia Petroleum Co.'s No. 2 Allen Kemp No. 28 was dry and abandoned at 1,936 feet. W. B. Omohundro's No. 19 Pace made 70 bbls. at 1,658-60 feet.

Wilbarger County

Baker and others' No. 2 Waggoner-B made 25 bbls. at 1,890-1,903 feet. Dixie Oil Co.'s No. 1 Webb was dry and abandoned at 3,628 feet. Easter Oil Co.'s No. 1 Waggoner-A swabbed 300 bbls. at 2,337-50 feet. Empire Holding Co.'s No. 6 Ancell was dry and abandoned at 2,408 feet. Fain McGaha Oil Corp.'s No. 2 Waggoner-I was dry and abandoned at 1,973 feet. Lawson's No. 3 Waggoner-A was dry and abandoned at 2,529 feet. McKanna's No. 3 Waggoner-B made 180 bbls. at 2,278-97 feet. Phillips Petroleum Corp.'s No. 2 Norwood Waggoner was junked at 2,445 feet. Its No. 2 Waggoner-BBB made 130 bbls. at 1,868-1,904 feet. Its No. 7 Waggoner-Q made 15 bbls. at 1,873-87 feet and was drilled to a total depth of 1,888 feet. The Texas Company's No. 1 Waggoner-H was junked at 2,368 feet. Waggoner Refining Co.'s No. 10 Waggoner-E made 100 bbls. at 2,298-2,310 feet.

QUANTITY OF "FREE" CRUDE DIMINISHING

(Continued from Page 25)

Cushing Ref. Co.:			
Cushing	2,300	....	2,300
Empire Refineries, Inc.:			
Cushing	4,700	....	4,700
Empire Refineries, Inc.:			
Okmulgee	4,000	1,500	2,500
Empire Refineries, Inc.:			
Ponca City	7,500	3,750	3,750
Garber Ref. Co.:			
Garber	3,300	3,300	....
Gilmer Oil Co.:			
Ringling	1,100	1,100	....
Globe O. & R. Co.:			
Blackwell	5,000	5,000	....
Globe O. & R. Co.:			
Cushing	8,000	8,000	....
Illinois Oil Co.:			
Cushing	2,100	2,100	....
Imperial Oil Co.:			
Ardmore	2,000	2,000	....
Independent O. & G. Co.:			
Okmulgee	3,300	....	3,300
Johnson Oil Ref. Co.:			
Cleveland	5,800	5,000	800
Marland Ref. Co.:			
Ponca City	19,000	4,500	14,500
Mid-Cont. Pet. Corp.:			
West Tulsa	25,000	6,000	19,000
Northwest Ref. Co.:			
Tonkawa	3,000	3,000	....
Oil State Ref. Co.:			
Allen	1,200	1,200	....
Peppers Gasoline Co.:			
Covington	800	800	....
Pierce Oil Corp.:			
Sand Springs	7,200	4,000	3,200
Producers Oil Co.:			
Bristow	800	800	....
Prod. & Refrs. Corp.:			
West Tulsa	3,200	....	3,200
Pure Oil Co.:			
Ardmore	2,000	....	2,000
Pure Oil Co.:			
Muskogee	7,000	....	7,000
Rock Island Ref. Co.:			
Beckett	1,800	1,800	....
Shaffer O. & R. Co.:			
Cushing	10,000	....	10,000
Sun Oil Co.:			
Yale	4,800	950	3,850
Sinclair Ref. Co.:			
Muskogee	600	600	....
The Texas Company:			
West Tulsa	13,500	....	13,500
Texas-Pacific C. & O. Co.:			
Wynnewood	2,000	1,000	1,000
Tidal Oil Co.:			
Drumright	10,000	....	10,000
Transcontinental Oil Co.:			
Boynton	2,000	....	2,000
Transcontinental Oil Co.:			
Bristow	4,500	1,125	3,375
Walters Ref. Co.:			
Walters	1,000	1,000	....
Western Oil Corp.:			
Beckett	1,200	1,200	....
White Oak Ref. Co.:			
Allen	2,500	2,500	....
Wilcox O. & G. Co.:			
Bristow	1,000	1,000	....
Wirt Franklin Pet. Co.:			
Ardmore	2,500	1,000	1,500
Yale Oil Corp.:			
Yale	1,000	1,000	....
Total	210,000	81,025	128,975

Kansas Refineries

Plant—	Daily runs	Free oil	Controlled oil
Barnsdall Oil Co.:			
Wichita	2,500	....	2,500
Derby Oil Co.:			
Wichita	4,000	2,000	2,000
Eldorado Ref. Co.:			
Eldorado	2,200	2,200	....
Golden Rule Ref. Co.:			
Wichita	1,000	1,000	....
Hutchinson Ref. Co.:			
Hutchinson	1,000	1,000	....
Kanotex Ref. Co.:			
Arkansas City	5,500	5,500	....
Manhattan Oil Co.:			
Kansas City	5,000	....	5,000
National Ref. Co.:			
Coffeyville	6,000	6,000	....
Peerless Ref. Co.:			
Chanute	2,200	1,320	880
Shell Pet. Corp.:			
Arkansas City	20,000	....	20,000
Sinclair Ref. Co.:			
Coffeyville	9,500	....	9,500
Sinclair Ref. Co.:			
Argentine	8,500	500	8,000
Skelly Oil Co.:			
Eldorado	12,000	6,000	6,000
Standard Oil of Kans.:			
Neodesha	10,000	....	10,000
Vickers Pet. Co.:			
Potwin	2,000	2,000	....
White Eagle O. & R. Co.:			
Augusta	8,000	5,000	3,000
Wilhoit Ref. Co.:			
Joplin (Mo.)	500	500	....
Total	99,900	33,020	66,880

RECORD GASOLINE OUTPUT

Forty-five refineries operating in California and reporting to the Bureau of Mines established a new record in West Coast gasoline production in October with a daily average of 189,935 bbls. This is an increase of 6,315 bbls. over the daily output in September and 17,886 bbls. over the production in October of last year.

This gasoline production was obtained from a daily crude oil run to stills of 586,073 bbls. Of the daily gasoline production 21,318 bbls. was cracked gasoline and the remainder straightrun and natural gasoline. Stocks of gasoline in California on October 31 totaled 8,420,148 bbls.

IMPORTANT MATTERS ARE BEFORE A.P.I. CONVENTION

(Continued from Page 25)

following nominee: H. R. Gallagher, Shell Co. of California, San Francisco.

The term of office of Roy B. Jones expires.

One or more of the councillors for the Central United States group have suggested the following nominee: Roy B. Jones, Panhandle Producing & Refining Co., Wichita Falls.

The terms of office of Edward Prizer, R. D. Benson and Frank B. Fretter expire.

One or more of the councillors of the Eastern United States group have suggested the following: Frank B. Fretter, National Refining Co., Cleveland; Edward Prizer, Vacuum Oil Co., New York; William E. Smith, Standard Oil Co. of Kentucky, Louisville; George P. Whaley, Vacuum Oil Co., New York.

Distribution Group

The term of office of K. R. Kingsbury expires.

One or more of the councillors for the Pacific Coast group have suggested the following nominee:

K. R. Kingsbury, Standard Oil Co. of California, San Francisco.

The term of office of R. W. Stewart and S. C. Collins expire.

One or more of the councillors for the Central United States group have suggested the following nominees: E. J. Bullock, Standard Oil Co. of Indiana, Chicago; Waldo Emerson, Tide Water Oil Sales Corp., Chicago; J. H. Graham, Indian Refining Co., Lawrenceville; M. J. Grogan, Louisiana Oil Refining Corp., Shreveport; L. L. Marcell, White Eagle Oil & Refining Co., Kansas City; D. W. Moffitt, Mid-Continent Petroleum Corp., Tulsa; B. H. Stephens, Magnolia Petroleum Co., Dallas; R. W. Stewart, Standard Oil Co. of Indiana, Chicago.

The term of office of Amos L. Beaty expires.

One or more of the councillors for the Eastern United States group have suggested the following nominee: Amos L. Beaty, New York.

Transportation Group

The term of office of J. Howard Pew expires.

One or more of the councillors of the Transportation (Ships) group have suggested the following: F. S. Fales, Standard Oil Co. of New York, New York; J. Howard Pew, Sun Oil Co., Philadelphia.

Pipe Lines

The term of office of C. H. Kountz expires.

One or more of councillors for the Transportation (Pipe Lines) Group have suggested the following nominees:

Charles Fitzgerald, Pure Oil Pipe Line Co., Dallas; C. H. Kountz, Prairie Pipe Line Co., Independence; E. H. Leroux, Oklahoma Pipe Line Co., Muskogee.

Supply Group

The term of office of John Reid expires.

One or more of councillors for the Supply Group have suggested the following nominees:

W. E. Carroll, Oil Well Supply Co., Pittsburgh; C. P. Clark, Clark Brothers Co., Olean; W. E. Frick, Frick Reid Supply Co., Pittsburgh; James D. Graham, National Tube Co., Pittsburgh; W. A. Knapp, Butler Manufacturing Co., Kansas City; John Lockhart, Parkersburg Rig & Reel Co., Parkersburg; C. C. Ramsdell, Gilbert & Barker Manufacturing Co., Springfield; Fred H. Thomas, C. & G. Cooper Co., Mount Vernon.

Foreign Trade Group

The term of office W. C. Teagle expires.

One or more of the councillors of the Foreign Trade Group have suggested the following nominee:

W. C. Teagle, Standard Oil Co. of New Jersey, New York.

"At Large" Group

The terms of office of F. B. Henderson, S. A. Guiberson, Jr., W. G. Skelly, and E. W. Marland expire. Councillors suggest following:

Richard Airey, Asiatic Petroleum Co., New York; Taylor Allderdice, National Tube Co., Pittsburgh; James Anderson, Humble Oil & Refining Co., Houston; L. T. Barneson, General Petroleum Corp., Los Angeles; N. C. Beim, W. H. Barber Co., Minneapolis; Howard Bennette, Western Petroleum Refiners Association, Tulsa; Paul G. Blazer, Ashland Refining Co., Ashland, Ky.; A. V. Bourque, Natural Gasoline Association of America, Tulsa; R. A. Broomfield, Barnsdall Oil Co., Los Angeles; E. R. Brown, Magnolia Petroleum Co., Dallas; E. J. Bullock, Standard Oil Co. of Indiana, Chicago; A. J. Byles, Tidewater Associated Oil Co., New York; W. E. Carroll, Oil Well Supply Co., Pittsburgh; W. L. Childs, Reed Roller Bit Co., Houston; J. D. Collett, O'Keefe & Collett, Fort Worth; E. P. Corey, Youngstown Sheet & Tube Co., Youngstown; A. F. Corwin, Standard Oil Co. of New York, New York; Henry M. Dawes, Pure Oil Co., Chicago; Wesley J. Beck, American Rolling Mill Co., Middletown, Ohio; T. J. Donahue, The Texas Company, Houston; Charles Ephgrave, Carson Petroleum Co., Chicago; W. H. Ferguson, Continental Oil Co., Denver; J. B. Foster, Foster Oil Co., Tulsa; Jacob France, Mid-Continent Petroleum Co., Tulsa; James B. Graham, National Tube Co., Pittsburgh; S. A. Guiberson, Jr., Guiberson Oil Investment Co., Los Angeles; F. B. Henderson, Associated Oil Co., San Francisco; W. K. Holmes, The Texas Company, Port Arthur; W. F. Humphrey, Associated Oil Co., San Francisco; Walter F. Ingals, Central Tube Co., Pittsburgh; R. B. Kahle, Beacon Oil Co., Everett, Mass.; E. C. Kincaid, Gulf Production Co., Houston; K. R. Kingsbury, Standard Oil Co. of California, San Francisco; C. V. Lally, Pittsburgh Steel Products Co., Pittsburgh; C. L. Maguire, Northland Oil Co., Chicago; John Markham, Jr., Tulsa; E. W. Marland, Ponca City; Edward P. Moore, Simms Oil Co., Dallas; D. J. Moran, Marland Oil Co., Ponca City; F. B. Parriott, Transcontinental Oil Co., Tulsa; John G. Phillips, Southwest Supply Co., Bartlesville; Waite Phillips, Independent Oil & Gas Co., Tulsa; E. H. Salrin, Tidal Oil Co., Tulsa; H. J. Scott, Transcontinental Oil Co., Tulsa; E. L. Shea, Tide Water Oil Co., New York; Paul Shoup, Associated Oil Co., San Francisco; L. E. Schultz, Pratt & Whitney, Houston; W. G. Skelly, Skelly Oil Co., Tulsa; R. W. Stewart, Standard Oil Co. of Indiana, Chicago; J. A. Talbot, Richfield Oil Co., Los Angeles; W. C. Teagle, Standard Oil Co. of New Jersey, New York; Jacques Vinmont, Texas Company of California, Los Angeles; W. G. Violette, Standard Oil Co. of Kentucky, Louisville; A. E. Walker, Republic Iron & Steel Co., Youngstown; J. Cook Wilson, Wilson-Broach Co., Beaumont.

Directors At-Large Elected by the Board

The terms of office of E. W. Brown, Henry M. Dawes, John Markham, Jr., and Taylor Allderdice expire.

Ex-Officio Members

Axtell J. Byles and A. C. Macbeth are ex-officio members of the board of directors by reason of their being vice presidents. Their terms of office expire.

Late Fields

(Continued from Page 34)

total depth of 772 feet. Sun Oil Co.'s No. 11 Mitchell, another shallow test, but 2,400 feet north of the new pool, tested salt water at 1,508 feet. Gulf Production Co.'s No. 5 Invincible, Blue Ridge, an old well deepened to 3,747 feet, was brought in Monday afternoon flowing an estimated 425 bbls. daily. Humble Oil & Refining Co.'s No. 2 Lizzie Smith, Boggy Creek Dome, East Central Texas, blew out Monday night while drilling in chalk at 3,629 feet. No estimate of production had been made Tuesday.

COLORADO

DENVER, Colo. Nov. 27.—Several Denver scouts have gone to the Kelly Oil Co.'s No. 1 State, Section 36-14s-57, in Lincoln County, eastern Colorado, 60 miles east of Colorado Springs, to investigate a reported strike. A report to the state immigration department from an officer of the company says the well is bottomed at 1,400 feet and still in hard cap rock believed to overlay the Dakota sand.

High gravity paraffin base oil rises in the 8-inch casing 18 inches in 24 hours and the temperature of the oil indicates, according to this authority, that the oil is being forced up through cap rock by heavy pressure. The well is shut down until after Thanksgiving and in the meantime a control head will be installed. The well is some distance to the south of the Fort Morgan anticline which is receiving considerable attention and which becomes buried as it trends southward.

CALIFORNIA

Barnsdall's No. 13 Odea, in Rosecrans, re-drilled and deepened to 5,404 feet and re-completed is doing 2,050 bbls. of 37 gravity oil and 1,500,000 feet of gas daily. This is not a new zone but is deeper than the sand from which most wells are producing.

NATURAL GASOLINE IN PRICE ADVANCE

(Continued from Page 24)

lic utility plants located in Kansas and Kansas City, Mo. This was a particularly desirable outlet for the reason that with the short rail haul the refiners were able to absorb part of the freight rate advantage.

Somewhat the same situation obtained in Texas and Oklahoma. Now these States are covered with a network of natural gas lines extending as far north as Kansas City. The line leading from the Texas Panhandle to Pueblo and Denver has cost the refiners some important fuel business in Colorado. In some cases, due to the low fuel oil prices, the refiners can offer the industrial buyers a better proposition than they are now obtaining from the natural gas people. Usually, however, the buyers are tied up with long-time contracts and cannot shift back to fuel oil.

This situation has meant that Mid-Continent refiners have been forced to offer more and more fuel oil in markets far distant from their plants where they come in competition with material available at plants located within the consuming area. The short rail haul gives the latter refiners an advantage. Large quantities of cheap West Texas fuel oil also are being offered in these markets.

The only remedy suggested is a further increase in cracking facilities for the purpose of reducing the quantity of fuel oil available. In this connection many of the railroad contracts on fuel oil will soon come up for renewal in Oklahoma and other Mid-Continent points. These contracts during the past year have netted the refiner more than he would have obtained on the spot market. Some of the refiners have stated that they will insist on a renewal of the contracts now in effect.

Refinery Gasolines

As reported in the following table, the weighted average price as of Monday on the 58-60 U. S. Motor grade shows a slight decline over last week. This price is based on reports from representative refiners on sales to jobbers only. The price range on the U. S. Motor grade as reported by these refiners varied from 8⅞ to 9⅜ cents. The bulk of the Monday business was placed at 9¼ cents.

Weighted Average Prices

Grade—			Price— Nov. 26	Price— Nov. 19
58-60	437	endpoint	.0927	.0932
60-62	437	endpoint	.0955	*
60-62	400	endpoint	.0984	.0975
64-66	375	endpoint	.1056	.10375

*No sales reported.

The 60-62 400 grade was available from several refiners at 9¼ cents and sales of the 64-66 375 at 10 cents were reported. In the sale of these higher gravities the competition of North Texas was an important factor. No export business was placed during the past week although inquiries were reported.

Kerosene and Distillates

Kerosene is suffering from a seasonal slowness in demand but prices the first of the week were unchanged. The price range on the 41-43 water grade to the jobber trade varied from 5¾ to 6¼ cents. Export inquiries on basis of 5¼ cents North Texas were reported. So far as known no business was placed with Oklahoma refiners on that basis.

The better grades of distillates are strong. Several refiners selling a 38-40 straw distillate with an initial under 190 have advanced their prices an eighth of a cent. The low on this grade material is 3⅜ cents with a high of 3¾ cents. The refiners expect a continued heavy movement of their distillates.

Gas Oil

There were no price changes in the industrial grades of gas oil. Low cold material of good color and sweet odor suitable for certain types of domestic burners is still bringing premium prices. Several trades at 2¾ cents for this grade material were reported during the week.

Lubricating Oils—Wax

Bright stocks are the feature of the lubricating list. Steam cylinder stocks are also strong especially those suitable for the manufacture of bright stocks. The advances in Mid-Continent bright stock recently have not kept pace with those effective in Pennsylvania and the Atlantic Seaboard. Two of the larger manufacturers in Oklahoma expect to advance their prices by December 1.

Neutrals are moving slowly and refiners anxious to move their output, have been forced to shade their prices.

Wax prices for the first time in several months were reduced during the past week. The spot market in wax has been slow in Oklahoma for several months. The few refiners making the product, however, were sold up for several weeks and prices were not reduced. Some new business was placed during the past week at 4¾ cents which was a quarter cent reduction from the low of 5 cents which has been effective for several weeks.

BOGGY CREEK PRODUCER MAKES 10 BBLS. AN HOUR

By Neil Williams

CORSICANA, Tex., Nov. 26.—One producer and two abandonments at Boggy Creek on the Anderson and Cherokee County line were the only developments of interest in the East Central Texas district the past week. Two other tests at Boggy Creek are preparing to test oil sands.

Humble Oil & Refining Co.'s No. 1 Roberts completed flowing 10 bbls. an hour with 1,000,000 feet of gas daily Monday was still producing at that rate through a three-eighths-inch choke. It was brought in from 3,634 feet. The well is a workover, completed early in October making 103 bbls. daily, 50 gravity.

The two abandonments were Humble's No. 1 Guaranty State Bank on the northwest flank, and No. 3 Weinberg on the northeast flank. The former was dry in sticky shale at 4,345 feet and the latter dry at 3,634 feet. These two tests are wildcats on opposite sides of the dome from production. Wildcatting on the northwest is being continued and a location was made for No. 1 Coleman in the Bullock Survey, 800 feet east of No. 1 Guaranty.

Humble's No. 2 Holloway on the southeast side of the dome, which tested salt water at 3,801 feet has been deepened to 3,851 feet where it is in a sand showing oil.

Of some interest was the finding of an oil sand in Why Not Oil Co.'s No. 2 Rhea, Limestone County. This test has cemented 6⅝-inch casing at 2,885 feet and will test at 2,891-95 feet.

Daily average production in the East Central Texas district during the week was 22,009 bbls., a decrease of 188 bbls. Production of Boggy Creek was held down to a minimum but Humble Pipe Line Co. will lay an 8-inch line from the field to its trunk line at Groesbeck, 60 odd miles distant. With the completion of this line, facilities will be available

to permit a larger production. Daily average production by fields was:

EAST CENTRAL TEXAS

Boggy Creek	1,584
Cedar Creek	235
Currie	511
Mexia	6,395
Minerva	750
Nigger Creek	525
Powell	9,909
Richland	490
Thrall	35
Wortham	1,575
Total this week	22,009
Total last week	22,197
Decrease	188

TEXAS CORPORATION BUYS LOUISIANA RIGHTS

NEW YORK, Nov. 24.—The Texas Corporation has contracted with the Louisiana Land & Exploration Co. to purchase the rights to develop 2,000,000 acres of oil lands owned in fee or by lease by the land company. Stockholders of the Louisiana company will meet November 30 to ratify the contract.

The land is on the southern coast of Louisiana, bordering on the Gulf, and extends east from the Sabine River to the Mississippi. Approximately 1,300,000 acres are grants on lakes, waterways and bays, while the balance is owned by the Louisiana company in fee. The various tracts were grouped under the control of the Border Research Corporation by E. F. Simms of Houston, Tex., and Paris, Ky., two years ago, the company's name being changed during 1927 to the Louisiana Land & Exploration Co.

Thus far, nine salt domes and one fractional dome have been discovered on the acreage. The Amerada Corp. did the geophysical work, using the seismograph. Amerada is interested in the Louisiana company through ownership of a portion of the 3,000,000 no-par value shares.

Under the contract The Texas Corporation will have exclusive right to prospect, drill for and produce oil, gas and sulphur. In exchange, The Texas Corporation will pay the Louisiana company a royalty of 25 per cent on the oil and natural gas and in addition 8½ per cent of the net profits from operations and 75 cents a ton on all sulphur produced together with 50 per cent of the net profits from sulphur output.

The Texas Corporation has agreed to drill at least four wells on each of the nine domes discovered, and any others which may be discovered, and two wells on the dome partly owned by the Louisiana company. Six of the domes discovered are on fee lands. On the land under lease the Louisiana concern has agreed to pay the State royalty.

In return for these rights, The Texas Corporation also agrees to assume all of the $1,800,000 of first and second mortgage bonds of Louisiana Land & Exploration Co. outstanding, dated May 1, 1927, and due May 1, 1930, and to pay all interest accruing after November 1. The Texas Corporation, however, is entitled under the agreement to reimbursement to the extent of $800,000 on the bonds, and is to retain, until the amount is paid, one-half of the Louisiana company's royalties and profits.

The Louisiana Land & Exploration Co. on November 13 brought in a 2,000-bbl. producer. The Texas Corporation manufactures its lubricating oil from this grade of Gulf Coast crude, and the agreement with Louisiana Land & Exploration is considered in the nature of the creation of a reserve supply of this crude for The Texas Corporation.

SUPERIOR MOVES OFFICES FROM HOUSTON TO TULSA

HOUSTON, Tex., Nov. 26.—Offices of the Superior Oil Corp., which have been maintained here since the recent acquisition of the Moody Corp. of this city, are being moved to Tulsa. P. C. Murray, manager, who came to Houston from Fort Worth at the time of the purchase, and John Bissonnet, auditor, comprise the office force to be transferred, the remainder electing to stay in Houston.

Drilling operations of the company now under way in the Gulf Coast which still are carried under the name of the Moody Corp., will be completed under the supervision of the field superintendent at Pierce Junction, where two tests are drilling. The Superior Oil Corp. will not operate in the Gulf Coast area and its only connections here will be in its already producing wells.

Fiftieth Anniversary Of First Pipe Line To Atlantic Seaboard

BRADFORD, Pa., Nov. 23.—Twenty-seven members of the Tide Water Associated Oil Co. gathered yesterday at a noonday luncheon in the Hotel Holley to celebrate the fiftieth anniversary of the organization of the first pipe line ever built to the seaboard and the first 6-inch line ever attempted anywhere.

Among the officials who were present from out of the city were A. J. Byles, president of Tide Water Oil Co.; R. McKelvy, vice president of Tide Water Oil Co.; M. P. Williams, president of the Associated Producers Co.; Noel Robinson, president of Tide Water Pipe Co.; C. F. Watson, assistant to president of Tide Water Pipe Co. Accompanying the officials to this city was George J. Hanks, general manager of the Tide Water Pipe Co. in this city. Hanks returned from New York City after attending a conference of Tide Water executives there.

Axtell J. Byles, president of the Tide Water Associated Oil Co., made a plea for stabilization of the whole American industry.

Confidently Face Future

"The industry may now face the future with complete confidence in the ability of operators and engineers to make steady progress in the improvement of mechanical devices and processes," said Mr. Byles. "Its major and more difficult problem is that of stabilization—the replacement of reckless and uneconomic competition, duplication of facilities and uncontrolled production of an irreplaceable and indispensible raw material. During the last two years the beginnings of progress along these lines have been made. I am confident that progress will continue. The important thing to remember is that what has been accomplished in the way of stabilization is very little indeed toward what must yet be accomplished if the industry is to realize its full possibilities of permanent service to investors of capital and labor and to the public itself."

In starting his speech Mr. Byles briefly reviewed the elder company's history as follows:

Eight Hundred Thirty-three Miles of Lines

"Fifty years ago today the Tide Water Pipe Co., Ltd., was organized to transport petroleum from the original oil fields of northwestern Pennsylvania to the Atlantic Seaboard. The company's lines now extend from Bayonne, N. J., to Stoy, Ill., a distance of 833 miles, these connecting with pipe line systems serving the Mid-Continent and southwestern fields. At no time during this half century has the flow of oil through the lines ceased, more than 155,000,000 bbls. have been transported.

"It is interesting to note that, notwithstanding the uninterrupted movement of crude through these lines, they now supply less than one-third of the crude run to stills at the Bayonne plant, the remainder being water-borne and delivered at the Tide Water Oil Co.'s eastern manufacturing plant by tank steamers.

Held Act of Insanity

"The construction of this pioneer line to the eastern seaboard was viewed by the majority of the fraternity at that time as almost an act of insanity, the belief being that it was physically impossible to lift oil by this means over the Alleghenies. The reduction of transportation rates which resulted from the success of this undertaking was prophetic of the progress which was to be made in all branches of the industry during the ensuing 50 years."

GULF COAST MARKET FAILS TO STRENGTHEN

HOUSTON, Tex., Nov. 27.—Despite a reported good tank car demand for Gulf Coast lubricating stocks and several inquiries for cargo lots of 100 and 200 viscosity oils for export, the Coastal market Tuesday failed to reflect any strengthening of prices. These prices, although far from satisfactory to sellers, continued steady and buyers apparently still are content to fill their requirements without shopping.

No sales for export movement in cargo lots were reported completed up to Tuesday noon. Fuel oils continued extremely soft although gas oils were strong with little of the latter material available on the open market as the week opened. Virtually the only spot business of fuel oil except for bunkering ships reported the past week was one 3,000-bbl. order of off grade stock.

OIL HAS A BIG PLACE IN LOS ANGELES SHOW

Petroleum industries will be largely represented in the Western States Metal and Machinery Exposition and Western Metal Congress, to be held in Los Angeles, January 14 to 18, according to W. H. Eisenman, secretary of the American Society for Steel Treating, who is in Los Angeles making the arrangements.

The show to be held in the Shrine Civic auditorium, Mr. Eisenman stated, has arranged liberal displays of the welding processes, both by gas and electricity, sucker rods, tool bits, joints, union and other oil field equipment, as evolved in the last year.

For the American Petroleum Institute, California Division of Development and Production Engineering, A. C. Rubel, district chairman, has announced papers on "Sucker Rod Strains and Stresses," by F. W. Lake, of the Union Oil Co.; "Drill Pipe Failures," by Ben Stroud, National Tube Co.; "Casing Failures," by K. V. King, Standard Oil Co., of California, and "Welding and High Pressure Gas Distribution," by C. J. Coberly, of Kobe, Inc. Among the exhibits will be oil tool and equipment displays by leading manufacturers.

LOUY MADE TREASURER

At a meeting of the board of directors of the Prairie Pipe Line Co., held at Independence, Kans., November 22, Frank A. Louy, formerly assistant treasurer, was elected treasurer and director of the company to fill the vacancy created by the death of the late Ralph G. Hare.

WEST TEXAS FIELDS

(Continued from Page 36)

November 22 an offset well was drilled in and No. 1-A went dead. It had pay at 2,208-30 feet. Louisiana Oil & Refining Co.'s No. 1 Settles, east offset to the well, came in at 2,216-32 feet flowing and swabbing 1,340 bbls. in 24 hours. No. 1-A was deepened 5 feet without results. It was further deepened to 2,248 feet and the hole filled with oil but would not flow. It is reported the well is to be put on the pump.

When the well made its best record it was bottomed at 2,230 feet and on a four-hour test it flowed 300 bbls. Magnolia Petroleum Co.'s discovery well in the Dora Roberts Pool performed similarly. When the first offset to the Magnolia company's well was completed the discovery well went dead. However it was swabbed back and is now rated for 1,100 bbls. daily.

The sale of the properties brings the total sales of Henshaw Corp. to around $6,000,000. Within the past three years that concern has opened five pools. American Maracaibo Co. closed a deal a few days ago through which it bought the 32,000 acres of fee land in Winkler County from T. G. and Ida Hendricks and their remaining royalty interest in the Hendricks Pool.

O'Brien Pool

In the O'Brien Pool in southern Winkler County, Barnsdall Oil Corp.'s No. 1 Tobe Morton, SW cor. Section 26, Block B-12, topped the lime at 2,870 feet and is running casing. This well is the diagonal offset to Richardson, Kelsey and White Eagle Co.'s discovery well. The discovery well topped the lime at 2,648 feet and has a surface elevation of 2,729 feet. Elevation of No. 1 Morton is 2,730 feet.

Pay was topped at 2,805 feet in the discovery well but the best pay was found at 2,965-73 feet. No. 1 Morton was being cored when the lime was topped and the core showed saturated lime. Many are of the opinion the hole is crooked in this test and account for the low structural position on that theory. Others are of the opinion a fault condition may be proved in that territory. Several efforts have been made to determine whether or not the hole was crooked but all proved unsuccessful

On down to the southwest Prairie Oil & Gas Co.'s No. 1 Sealy, SW Section 95, Block A, had a showing of gas at 3,124 feet but after drilling the plug the hole filled 1,400 feet with sulphur water in two hours from 3,124-26 feet. The well is being drilled deeper.

On north in the Llano area of Winkler County, Magnolia Petroleum Co.'s No. 1 Scarborough, Section 1, Block C-22, is believed to be running high. A pocket of gas was encountered at 2,840 feet which ignited and burned the rig and most of the samples. Some geologists are of the opinion the lime was topped at 2,700 feet. The gas soon exhausted itself and a new rig is being moved in.

Two miles north of the pool Cranfill & Reynolds tore down the rig for their No. 1 Hendricks-F, NE cor. Section 16, Block 26, and will abandon the test at 2,900 feet without having topped the lime. Southern Crude company was on a deal with the owners to take the well over and drill it to the top of the lime for geological information, but the proposal fell through.

Leck Area

Some excitement should be coming from the Leck area within the next week or 10 days from one or more of the several wells that are down to interesting depths. Amerada Petroleum Corp.'s No. 1 Leck, Section 3, Block 74, mudded off 46,000,000 feet gas at 3,097 feet and is being bailed for a test at 3,152 feet.

Warner Quinlan Co. of Texas purchased the south 80 acres of the NW of Section 3, Block 74, and have moved in a rig on the SE cor. of the NW. The consideration is reported to be $2,500 an acre, payable entirely in oil. The north 80 acres is being retained by the royalty owners.

Since the discovery well was drilled in Hendricks two years ago the recovery of Winkler County has climbed to 52,356,098 bbls. from 406 wells up until November 1. Southern Crude Oil Purchasing Co. shows the greatest recovery with 8,423,562 bbls. Shell Petroleum Corp. ranks second with a recovery of more than 6,500,000 bbls., and the Gulf Production Co., Humble Oil & Refining Corp. and The Texas Company have produced more than 4,000,000 bbls.

Jones County

Jones County continues to come more into prominence due to the Tiner and Bickley Pools north of Noodle Creek. The Texas Company's No. 2 Carter is one of the best wells completed, and for the past few days has been increasing steadily in production. The Tiner Pool has 12 wells making around 2,174 bbls. daily, and the Bickley Pool is producing around 2,279 bbls. daily from 10 wells.

Less Crude to Storage

There was little change in the movement of crude in West Texas, according to the survey made for the seven-day period two weeks ago. Less crude was being run to storage as pipe line movements and deliveries to refineries increased slightly. Tank car shipments slumped to some extent. The increase in refinery runs was due primarily to the increase in runs to the Humble company's plant.

Below is a table showing crude move-

ments in West Texas for the past two seven-day periods.

	Previous period	This period
Movements through main lines	206,585	207,251
Tank car shipments	60,539	57,836
Runs to West Texas refineries	27,598	32,533
Total crude movements	294,722	297,620
Daily average production	324,066	325,386
Runs to storage	29,344	27,766

Production of West Texas showed a decline of 8,334 bbls. in comparison with the previous week's report, mainly due to the drop in production in Hendricks and Yates.

ESTIMATED DAILY AVERAGE PRODUCTION WEST TEXAS
Week Ended November 24

County—	Wells	Prod.
Crane County	271	38,691
Crockett County	47	2,922
Ector County	2	6
Fisher County	5	980
Glasscock County	17	1,325
Howard County	199	32,594
Jones County	51	5,450
Loving County	7	277
Mitchell County	141	2,476
Pecos County	272	67,342
Reagan County	224	17,224
Runnels County	3	280
Scurry County	5	31
Upton County	292	13,567
Winkler County	437	146,328
Total this week	1,973	329,493
Total last week	1,962	337,828
Difference	11	8,335

WEST TEXAS COMPLETIONS
Week ended November 24

Crane County

C. C. Duffey and others' No. 3 Cowden Brothers, 200 feet north and west of SE cor. SW Section 18, Block X, C.C. S.D.&R.G.N.G., topped the pay at 2,342-97 feet, was shot with 100 quarts at 2,-335-95 feet and had an initial production of 50 bbls.

Howard County

Empire Gas & Fuel Co.'s No. 1 H. R. Clay was drilled to a total depth of 1,767 feet, topped the pay at 1,738 feet, shot with 35 quarts at 1,741-64 feet and swabbed 80 bbls. F. H. E. Oil Co.s No. 4-D Dora Roberts, Section 136, Block 29, W.&N.W. Survey, pumped 560 bbls. oil, 5 per cent water, at 2,943-64 feet. F. H. E. Oil Co.s No. 7-E Dora Roberts pumped 1,238 bbls. in 18 hours at 3,035-45 feet. Magnolia Petroleum Co.'s No. 11 Kelly Chalk, 1,660 feet south and 330 feet east of NW cor. Section 124, Block 29, W.& N.W. Survey, pumped 35 bbls. at 1,645-75 feet and was drilled to a total depth of 1,678 feet.

Kent County

Pursley Ranch Development Co.s No. 1 fee, 330 feet east and 150 feet north of SW cor. Section 8, Block H, H.&T.B. Survey, was abandoned.

Loving County

Lockhart and others No. 1 Wheat-Ramsey, located 1,650 feet NW and 990 feet southwest of Section 83, Block 1, W.&N.W. Survey, was drilled to a total depth of 4,303 feet, plugged back to 4,206 feet, shot with 60 quarts at 4,187-4,200 feet and had an initial production of 38 bbls. per day.

Jones County

Cosden & Herbert Oil Co.s No. 5 Bickley, 330 feet south and 319 feet west of NE cor. S half of NW Section 50, Block 18, T.&P. Survey, made 720 bbls. at 2,463-69 feet. McMan Oil & Gas Co.'s No. 1 Bickley, 2,320 feet west and 1,650 feet south of NE of Section 50, Block 18, T.&P. Survey, made 310 bbls. at 2,447-49 feet. Snowden & McSweeney's No. 2 Bickley, 330 feet south and 959 feet west of NE cor. of N half of NW Section 50, Block 18, T.&P. Survey, made 750 bbls. at 2,505-13 feet.

Midland County

C. P. Shelton and others' No. 1 Francis, 2,040 feet north and 600 feet west of Section 13, Block 40, Township 4s, T.&P. Survey, topped the lime at 4,510 feet, and was dry and abandoned at 4,565 feet.

Terrell County

Champlin Oil & Refining Co.'s No. 1 Carter was dry and abandoned at 3,553 feet.

Ward County

Denver P. & R. Co.'s No. 1 Cherokee Land & Investment Co., 990 feet from northeast line and 2,310 feet from southeast line, Section 215, Block 34, H.&T.C. Survey, was dry and abandoned at 4,703 feet after encountering the black lime at 4,664 feet.

Pecos County

McMan Oil & Gas Co.'s No. 2-C Smith made 295 bbls. per hour at 1,640-1,722 feet.

Winkler County

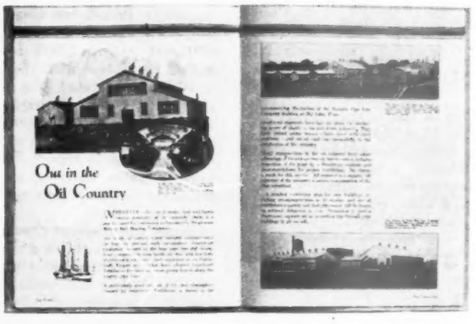
Humble Oil & Refining Co.'s No. 7-B Hendricks, 2,275 feet south and 330 feet west of Section 39, Block 26, topped the lime at 2,337 feet, topped the pay at 2,733 feet, was drilled to a total depth of 2,790 feet and hd aan initial production of 116 bbls. hourly, 16 per cent water. Southern Crude Oil Purchasing Co.'s No. 5 Hendricks T-67-3-B, located 2,310 feet south and 330 feet west of NE cor. Section 33, Block 26, topped the lime at 2,497 feet, topped the pay at 2,938 feet, was drilled to a total depth of 3,016 feet and had an initial production of 75 bbls. hourly, 6 per cent water. Its No. 1 Hendricks T-67-2-D, located 330 feet south and 990 feet west of Section 28, Block 26, topped the lime at 2,574 feet, topped the pay at 2,808 feet, was drilled to a total depth of 2,836 feet and had an initial production of 60 bbls. hourly, 3 per cent water. Its No. 4 Hendricks T-88-J, located 330 feet south and east of Section 30, Block B-5, topped the lime at 2,670 feet, topped the pay at 2,757 feet, was drilled to a total depth of 3,021 feet, plugged back to 3,010 feet and had an initial production of 700 bbls. daily, 2 per cent water. Its No. 4 Hendricks T-88-K, located 2,200 feet north and 990 feet east of Section 41, Block 26, topped the lime at 2,575 feet, topped the pay at 2,825 feet, was drilled to a total depth of 2,825 feet and had an initial production of 180 bbls. hourly. Its No. 3 Hendricks- T-88-N, located 440 feet south and 330 feet east of Section 28, Block 26, topped the lime at 2,310 feet, topped gas at 2,610 feet, estimated 50,000,000 feet of gas, and had an initial production of 77 bbls. hourly. Its No. 5 Hendricks T-88-N, located 200 feet south and 1,320 feet east of Section 28, Block 26, topped the lime at 2,338 feet, topped the pay at 2,730 feet, was drilled to a total depth of 2,766 feet and had an initial production of 65 bbls. per hour. Its No. 2 T-88-R, located 1,320 feet south and 330 feet west of NE cor. Section 27, Block 26, topped the lime at 2,300 feet, topped the pay at 2,610 feet, had a gas show at 2,614 feet, made 15,000,000 feet of gas, was drilled to a total depth of 2,614 feet and had an initial production of 600 bbls. daily. Its No. 1 T-88-V, located 1,650 feet south and 330 feet east of Section 29, Block 26, topped the lime at 2,718 feet, topped the pay at 3,015 feet, was drilled to a total depth of 3,025 feet and had an initial production of 22 bbls. hourly.

PECOS COUNTY
Week Ended November 24, 1928

Company, lease—	Wells	Bbls.
California Co.:		
Yates, Lease 1	17	6,786
Smith, Lease 1, Sec. 37	3	421
Smith, Lease 1, Sec. 23	3	374
Smith, Lease 2	2	124
Smith, Lease 3	12	1,867
Tippett, Lease 1	1	31
Cosby Drilling Co.:		
M. A. Smith	1	off
Gulf Prod. Co.:		
All leases	32	9,540
Humble Oil & Ref. Co.:		
M. A. Smith	10	1,306
Smith-B	5	641
Kirby Pet. Co.:		
J. H. Tippett	1	44
Kirby Pet. & Edson:		
J. H. Tippett	1	225
Marland Oil Co.:		
Yates-A	10	1,283
Matador Oil Co.:		
Smith	2	1,566
Mazda & Savoy:		
Smith	2	625
McMan Oil & Gas Co.:		
Smith-A	1	427
Smith-B	4	895
Smith-C	2	465
J. H. Tippett	3	311
McMan & Marland:		
Yates	17	3,070
Mid-Kansas & Transcontinental:		
Yates-A	24	9,089
Yates-B	25	4,705
Yates-C	9	3,279
Yates-D	6	6,369
Yates-E	1	120
Yates-F	3	590
Yates-G	4	1,048
Yates-H	6	5,181
Smith	2	65
Smith-Taylor	18	2,204
Oil Operators Trust:		
Pecos River	7	750
Phillips Pet. Co.:		
Smith	1	83
Red Bank Oil Co.:		
Smith	4	184
Shell Pet. Co.:		
Tippett	11	1,598
Smith	9	883
Smith-B	1	812
Smith-D	2	372
Simms Oil Co.:		
Smith	7	3,666
Skelly Oil Co.:		
Tippett	1	101
Texon Oil & Land Co.:		
Yates	2	...
Total Yates Field	272	71,034

WINKLER COUNTY
Week Ended November 20

Company, farm, section, block—	Wells	Prod.
Amerada Pet. Co.:		
Cowden, 3, B-12	1	411
Atlantic O. P. Co.:		
Hendricks-A, 34, B-5	8	1,449
Hendricks-B, 44, 26	3	456
Hendricks-D, 29, B-5	8	2,393
Hendricks-E, 41, B-5	3	1,421
Hendricks-G, 40, 26	6	2,570
Hendricks-H, 30, B-5	1	70
Atlantic & Collett:		
Hendricks-F, 40, 26	12	8,401
Atlantic-Kessler & Logan:		
Leck, 3, 74	1	586
Bankers Prod. Co.:		
Hendricks, 30, B-5	1	152
California Co.:		
Hendricks, 29, B-5	8	1,328
Cranfill & Reynolds:		
Hendricks-A, 28, B-5	2	526
Hendricks-B, 35, B-5	1	126
Hendricks-C, 33, 26	2	1,628
Hendricks-D, 33, 26	1	220
Hendricks-E, 33, 26	2	989
Eastland Oil Co.:		
Hendricks, 33, B-5	2	490
Hendricks-B, 35, B-5	1	113
Empire Gas & Fuel Co.:		
Daugherty, 3, 74	1	346
Gulf Prod. Co.:		
Hendricks-A, 34, B-5	12	3,500
Hendricks-B, 45, 26	10	3,377
Hendricks-C, 40, B-5	5	2,320
Humble Oil & Ref.:		
Hendricks-A, 34, B-5	16	6,686
Hendricks-B, 29, B-5	6	1,470
Hendricks-C, 32, 26	8	1,533
Hendricks-D, 47, 26	4	1,223
Independent O. & G.:		
Hendricks-A, 34, B-5	7	2,020
Howe-B, 44, 26	2	200
McCabe, 36, B-5	2	302
Hendricks, 42, B-5	1	21
Vardemen-B, 41, B-5	6	1,392
Magnolia Pet. Co.:		
Hendricks, 29, B-5	8	881
Marland Oil Co.:		
Hendricks, 33, 26	4	1,420
Hendricks-A, 29, 26	1	102
Hendricks-B, 34, 26	1	291
Mining & Eng. Co.:		
Hendricks, 10, B-12	1	220
Murchison & Cranfill:		
Hendricks-A, 35, B-5	3	802
Hendricks-B, 35, B-5	3	1,190
Hendricks-C, 35, B-5	1	50
Hendricks-H, 33, 26	1	2,000
Hendricks-I, 34, 26	2	412
Prairie Oil & Gas:		
Hendricks, 40, 26	6	3,063
Cowden, 3, B-12	1	841
Pure Oil Co.:		
Hendricks-A, 41, B-5	10	2,612
Hendricks-B, 34, B-5	13	2,673
Hendricks-C, 45, 6	8	7,704
Republic Prod. Co.:		
Hendricks-A, 45, 26	3	2,110
Hendricks-B, 41, B-5	5	1,531
Hendricks-C, 42, B-5	5	890
Richardson et al:		
Stockton, 50, F	1	951
Shell Pet. Co.:		
Scarborough, 1, C-22	2	off
Hendricks-A, 45, 26	6	4,207
Hendricks-B, 29, B-5	6	1,356
Hendricks-C, 29, B-5	8	2,840
Hendricks-D, 41, B-5	6	851
Hendricks-E, 40, B-5	3	679
Hendricks-F, 46, 26	7	5,035
Hendricks-G, 39, 26	1	100
Shell-Texas:		
Cowden-A, 3, B-12	4	1,020
Hendricks, 45, 26	6	2,446
Hendricks-A, 29, B-5	10	2,720
Hendricks-B, 40, 26	6	1,869
Hendricks-C, 40, 26	6	3,919
Hendricks-D, 40, 26	6	1,919
Hendricks-E, 40, 26	3	1,542
Skelly Oil Co.:		
Hendricks, 40, 26	12	8,388
Hendricks-B, 39, 26	1	19
Southern C. O. P. Co.:		
T-67 Hendricks-A, 42, B-5	4	206
T-67 Hendricks-3-A, 4, B-12	4	1,161
T-67 Hendricks-B, 44, 26	3	624
T-67 Hendricks-3-B, 33, 26	4	915
T-67 Hendricks-C, 33, B-5	5	749
T-67 Hendricks-2-D, 28, 26	1	749
T-67 Hendricks-E, 42, B-5	4	217
T-67 Hendricks-F, 33, B-5	4	403
T-68 Hendricks-3-A, 35, B-5	3	987
T-68 Hendricks-B, 46, 26	1	500
T-88 Hendricks-A, 44, 26	4	617
T-88 Hendricks-B, 4, B-12	2	512
T-88 Hendricks-C, 29, B-5	7	846
T-88 Hendricks-H, 28, B-5	4	756
T-88 Hendricks-I, 30, B-5	5	1,060
T-88 Hendricks-D, 4, B-12	1	936
T-88 Hendricks-J, 30, B-5	3	1,220
T-88 Hendricks-K, 41, 26	3	953
T-88 Hendricks-L, 4, B-12	1	410
T-88 Hendricks-M, 33, 26	21	7,215
T-88 Hendricks-N, 28, 26	4	1,062
T-88 Hendricks-P, 28, 26	1	133
T-88 Hendricks-R, 27, 26	2	862
T-88 Hendricks-S, 34, 26	2	930
T-88 Hendricks-T, 34, 26	5	830
T-88 Hendricks-U, 41, 26	4	1,252
T-88 Hendricks-V, 29, 26	1	200
T-89 Hendricks-A, 35, B-5	3	230
T-89 Hendricks-B, 35, B-5	2	525
T-89 Hendricks-F, 40, B-5	1	140
T-90 Hutchins, 47, 26	1	134
Texon Oil & Land:		
Hendricks-A, 41, B-5	6	789
Hendricks-B, 45, B-5	5	1,462
Winkler O. P. Co.:		
Hendricks, 32, 26	1	857
Total Winkler County		145,450



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Of Interest to Sales Departments

Sees Great Britain As Large Buyer of Burner Distillates

By Charles E. Kern
Washington Bureau, The Oil and Gas Journal

WASHINGTON, D. C., Nov. 24.—Whenever the domestic oil burner industry becomes slack in the United States there is open to our manufacturers a very inviting market in Great Britain, especially in England, and on the continent of Europe, according to views expressed by Dr. Gustav Egloff, of the Universal Oil Products Co., who has recently returned from London where he attended the World Power Fuel Conference as a delegate of the United States.

"The greatest difficulty our manufacturers of domestic oil burners will find in a campaign to introduce oil burners abroad will be in awakening the people to an ambition to enjoy the luxury of this modern method for heating homes which is growing to be so commonplace in the United States," said Doctor Egloff. "They have to overcome the conservatism of the Englishman. Going from the United States where we adopt new ideas so readily and where the domestic oil burner is becoming an every day affair, I was amazed upon finding scant attention had been paid abroad to this means for home comfort, there being a practical absence of oil heating.

"In the discussions at the meeting of the Fuel Conference and in private conversation there were frequent references to the use of coal, gas and electricity for home heating and their relative merits were stressed. As the products of petroleum have been shipped to England in large quantities, I supposed that during recent years they had made at least some progress in finding a market for these products in household use. However, the advantages of heating homes by oil has not been taken up there by any body of men interested in pushing the introduction of household oil heaters. The great resistance to change of the average Englishman, who has been heating his home with coal in open fireplaces from time immemorial has apparently made him indifferent to this innovation.

Overcome Prejudice

"Strong prejudice must be overcome in Europe and particularly in England before oil burners in numbers will be employed for household purposes. However, the fact that oil burning for home heating has enormously developed in the United States during the last five years was brought to the attention of delegates at the World Power Fuel Conference representing 47 other countries. They were told that it is now estimated that of the 20,000,000 dwellings in the United States approximately 700,000

(Continued on Page 181)

NEW RAILROAD FOR PANHANDLE

The Texas Panhandle Refining area may be serviced by another railroad in the near future if plans outlined by the Fort Worth and Denver City Railroad are approved by the Interstate Commerce Commission. The new line will run from Childress to Spearman, approximately 120 miles in length and will open a new area for refineries as well as afford a direct outlet over other roads, through terminal points.

At Spearman the road will intersect the Atchison, Topeka & Santa Fe. The line will pass through the oil field of Gray County. The new 208-mile line of the Fort Worth & Denver City, which runs to Lubbock, Plainview, Dimmitt and other points in the South Plains, intersects at Childress with the main line that runs between Denver and Dallas.

WIDENING DEMAND FOR SPECIAL MOTOR FUELS IN EASTERN STATES

By Special Correspondent

NEW YORK, Nov. 24.—With the close of the season of peak gasoline consumption for 1928 leading refiners and distributors in the East Coast marketing territory have been tabulating their sales figures for the season, with particular reference to the volume done on special motor fuels this season. Taken as a whole, gasoline gallonage in the East Coast territory in 1928, to date, not only ran materially in excess of that for the comparable period last year, but at record levels for all time. This development had been expected, of course, but considerable interest attaches to the progress made in developing distribution of special blends.

As might be imagined, it is extremely difficult to secure from refiners actual facts and figures regarding their gallonage on special blends, and their percentage increases in sales totals as well. In as much as the 1928 season was the first one in which the marketing of special motor blends really developed into a volume proposition for most refiners and in fact was the first year in the special blend trade for some, they are naturally loath to make public any comparisons with last season's sales totals, where the latter are available. As one prominent oil company executive expressed it, "Any data based on this summer's sales of special blends as contrasted with those for the summer of 1927 would not be truly representative, in as much as the business was largely being developed in an experimental way last year, and had but relatively few refiners engaged in it. This year, most of the big ones came in, and by the close of the 1929 motoring season we will have some comparable data which will really mean something."

Demand in East

The demand for special motor fuels in the East Coast territory is rather general and widespread, and shows signs of further heavy expansion during the cold weather months. This is one product which the refiners have been able to "put across" with a minimum of sales effort and advertising expenditure. For years the public has been eager for a superior motor gasoline, one that would not only keep carbon deposits at a minimum, and increase power, but a fuel that would give quicker acceleration and more "pep" in general to the motor. In consequence, the motoring public has been quick to try out the various blends now on the market, and once finding one which seems best adapted to its needs, continues to buy it. The premium of 3 cents a gallon over the price of ordinary standard U. S. Motor gasoline has created relatively little sales resistance. Refiners have realized the psychology of making their special blends as "different" in appearance from ordinary gasoline as possible, and thus motorists in East Coast territory have all the colors of the rainbow to choose from when buying premium gas.

One large refining and marketing organization, which ranks well up among the leading oil companies of the entire East Coast area, estimates that of its total sales for the year thus far, premium fuels have comprised about 25 per cent of the volume. Another large company, in the same category, places its percentage of premium fuels at anywhere from 10 to 35 per cent, according to territory. While it had been expected originally that much of the demand for high-compression motor gasoline would come from sections of the East where the country is extremely hilly, this theory has not worked out. Consumers in the large cities of the East, in many instances, are larger and more consistent buyers of premium fuel than motorists in mountainous country. Nor does the prosperity of the motorist, as judged from the appearance of the cars pulling into the filling stations, have much bearing upon the type of gasoline bought.

Some Surprises

For example, in some of the suburban sections of New York City and Philadelphia, generally known as "high class," because of the relatively wealthy type of resident, standard motor gasoline is bought in preference to the higher quality product.

On the reverse side of the picture, premium fuels have a good sale in the poorer sections of these cities.

The theory of salesmen for the refiners in this connection is that the wealthy car owner is of the belief that his motor is of such high quality that it requires no special fuel, while the owner of the humble flivver or dilapidated "Chevvie" thinks that his car must have the best on the market if it is to give full performance. Actually, there is little to either theory.

Practically all of the leading refining and marketing organizations in the East Coast territory now have their special brands of premium motor fuel, including ethyl gasoline, benzol blends, straight high-test gasoline, and California U. S. Motor, presumably with natural anti-knock qualities, tinctured a bright hue. By next summer, it is expected that all of the large factors will have fallen into line.

As previously stated, the refiners have had to put but a minimum of sales and advertising effort behind their premium motor fuels, but there are indications that the situation will be radically changed by next summer. With more competition in the field, the refiners will naturally have to intensify their sales activities.

Future of Premium Blends

While refiners are loath to make predictions regarding the future of the market for premium blends, it is nevertheless expected that sales will show a material gain during the 1929 season. Many sellers, relatively new to the premium motor fuel end of the business, expect to double their sales of this type gasoline next year. A conservative estimate is that the sales of special gasoline blends in East Coast territory next year will run from 30 to 35 per cent of the entire gallonage figures of the companies who have premium fuels.

Refiners see in the popularity of the special motor fuels an opportunity to capitalize their brand names more advantageously, and strike a more telling blow in defense of their distribution against the inroads of small independent marketers. While so-called "gyp" gasoline has been pretty effectively eliminated from the picture in this section of the country during the past two years, distributors of unbranded gasoline are reported to be still taking quite a few liberties in their statements relative to the origin of the gasoline which they handle, this, of course, applying to the retail sellers. The average proprietor of a filling station handling unknown or unbranded gasoline will cheerfully assure the curious customer that his gasoline is just the same as "Standard" or "Tydol" or "Texaco" or whatever well-known brand comes first to mind, ex-

(Continued on Page 176)

WATERWAY COMPLETIONS WILL AID OIL MARKETING

CHICAGO, Nov. 24.—A development of the interior waterway system which seems to have considerable significance for the oil industry is the completion of the route from Lake Michigan at Chicago to the Mississippi River and down that river to the Gulf. It is commonly referred to as the Lakes to the Gulf deep waterway. The channel is to have a minimum depth of 9 feet at all seasons. Recently a party of business men made an inspection trip over this course and reported that the work was well advanced and should be completed by the opening of navigation in 1930, or a little more than 18 months away.

Large shippers of heavy products have stated that they should make this route an important part in their system of collecting material and distributing heavy products from their plants at various cities along the route. It is not unlikely that crude petroleum and various petroleum products will be among the articles that will be transported by this route.

In considering the availability of the interior waterways the fact must be considered as of prime importance that these channels are not open for navigation the year round. The Great Lakes never freeze over, but the connecting channels and harbors are closed for a period varying with the severity of the winter and cannot be relied upon for more than six months of the year extending from May to November, inclusive. Water communication is maintained the entire year on the lakes during many seasons by the use of ice breakers at the leading harbors.

This fact has an important bearing on the use of water transportation by the Chicago oil companies. To obtain the full use of their transport facilities a large storage at various points from which distribution is made is necessary. A large amount of bulk storage is required if the territory served from that bulk station located at some lake port is to be able to supply the needs of the dependent communities through the season when the tankers are laid up for the winter season.

Standard of Indiana

Two of the local refining organizations are now provided with tankers. The Standard Oil Co. now has three tankers and one barge used for the transport of petroleum products between the refinery at Whiting and lake ports at points ranging as far north as Superior, Wis., and as far east as Detroit, Mich. The largest of these tankers is the "Robert W. Stewart," which was placed in commission this spring and has a rated capacity of 50,000 bbls. The two other tankers are smaller and less modern in plan and equipment, though thoroughly efficient.

The Roxana Petroleum Co. has within a month placed in commission its first tank ship, the "Martha W. Allen," which is rated as a 30,000-bbl. tanker, and is at the present time transporting petroleum products, chiefly gasoline, from the refinery at East Chicago to Detroit.

The Sinclair Refining Co. has planned to build or purchase tankers for use on the Great Lakes, and the announcement was made early in the season that two tankers would be sent around from New York to the refinery at East Chicago. Nothing further was done with this plan and at the present time the Sinclair Refining Co. is not operating any craft of any kind on the Great Lakes. The company is investigating sites for bulk stations at several lake ports.

Comparative Costs

As to the comparative costs of transporting petroleum on the lakes with rail-

(Continued on Page 176)

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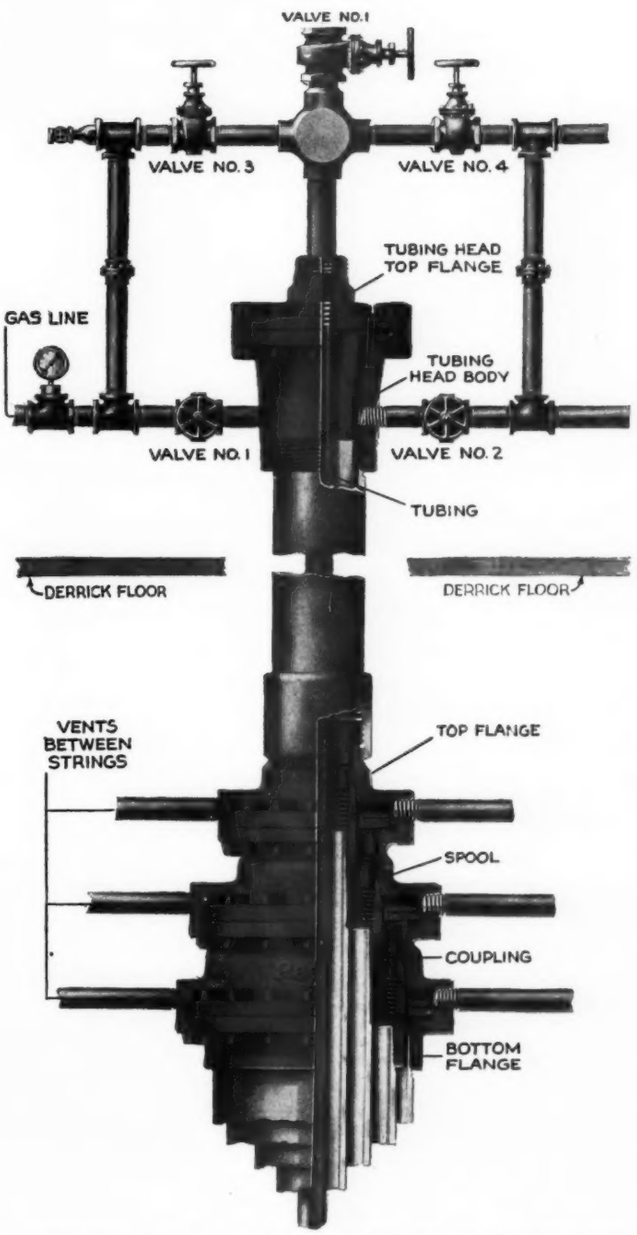

Above view shows Regan Control Head, Regan Tubing Head and a typical hook-up used in Mid-Continent for recovery of oil by air and gas lift. Production can be brought up through either the tubing or casing by manipulating the valves.

Distillation of Natural Gasoline

Application of Fundamental Principles of Physical Chemistry of Great Aid in Solving Practical Problems

By Dr. Walter J. Podbielniak*

Almost all of the operations of the natural gasoline plant may be gathered into two classes; the first class including the operations of transporting natural gas and gasoline, the second, vaporizing or condensing it in a variety of ways to accomplish certain desired separations more or less efficiently depending on the design and operation of the plant. Curiously enough distillation has been most neglected as regards fundamental research work. We would like to know more than we do about distillation or vaporization, and about condensation. How does the darn thing work? Does it strike at random, or does it follow some rules or laws? Can these processes be calculated and how?

These are natural questions, the answer to which is at once simple and involved, as this paper will endeavor to bring out. It is not at all implied that this paper will furnish the complete answer to the questions or even that it is any sort of an attempt to lay down distillation law or theory. Rather does it treat the subject in an odd-and-end fashion as implied in the title, with the purpose of bringing up discussion on a topic or rather topics of the greatest importance to the natural gasoline men; it is a monkey wrench thrown into the machinery for the joy of hearing it rattle.

Distillation is a hardy sort of a process and takes place almost under any conditions. Thus, in the Burrell or in the Shepherd and Porter apparatus for the analytical distillation of natural gas at low temperatures and pressures, the liquefied gas is distilled at a pressure of only a few millimeters of mercury or about one-hundredth of an atmosphere, at temperatures close to the boiling point of liquid air, that is, around minus 180 to minus 190 degrees Centigrade. The A.S.T.M. distillation is conducted at atmospheric pressure. Commercial fractionators are designed for pressure up to 250-pound square inch gauge and even higher or about 17 atmospheres. We are therefore naturally interested in such questions as the variation of the boiling point of natural gasoline with pressure and with the effect of pressure on the separation between components obtainable by distillation.

Whenever there is talk about distillation we must drag vapor pressure curves out of the attic as well as other physical constants of hydrocarbons being distilled.

Figure No. 1 shows a plot of the vapor pressure curves for propane, butanes, pentanes, hexanes, etc., over the pressure range 10 to 1,000 mm. of mercury. The curves are plotted on semilogarithmic cross section paper on which they become almost straight lines and are easily interpolated or exterpolated.

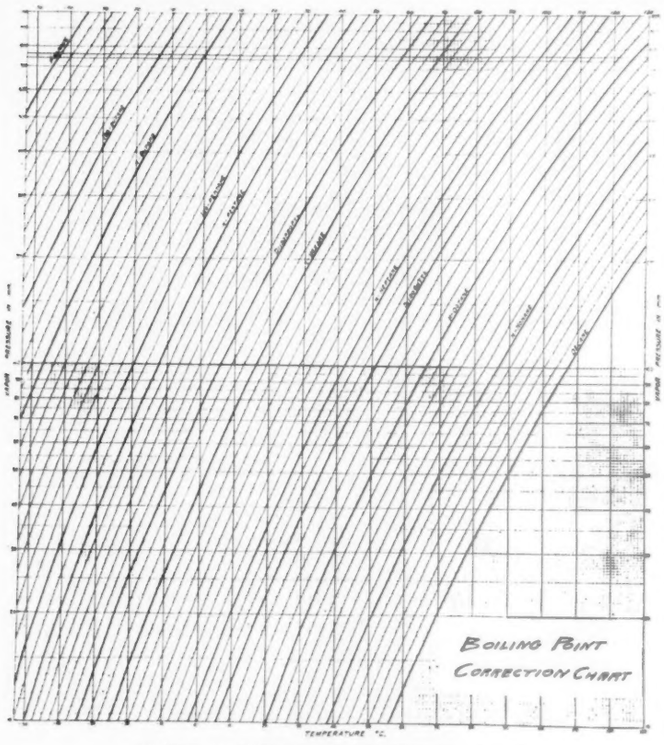

Figure 1—Chart of vapor pressure curves.

Vapor Pressure Curve

A vapor pressure curve is of course nothing more than the variation of boiling point with pressure, or, what amounts to the same thing, the variation of the vapor pressure of a liquid with its temperature. It will be observed that not only are the vapor pressure curves on the chart nearly straight lines for the range of pressures covered, but that they form a regular and well-behaved family of curves the slopes of which are not exactly the same but vary in the regular manner. The many fine lines evenly spaced between the heavy vapor pressure curves proper do not represent mysterious new hydrocarbons as their presence in this chart would seem to indicate, but are merely guide lines to aid the eye in running parallel to the vapor pressure curves.

In order to correct the boiling point of n-butane from any one pressure to another we may do so by simply following its curve which is nothing more or less than a statement of the change in the boiling point of n-butane, obtained experimentally and expressed graphically.

TABLE 2—VAPOR PRESSURES OF HYDROCARBONS IN MILLIMETERS OF MERCURY

Temp. °C.	Methane	Ethane	Propane	N-butane	N-pentane	N-hexane
—160	848	1.32	....	....	....	....
—130	7,410	43.4	1.48	....	....	....
—100	23,100	411	28.1	2.26	.084	....
—70	....	1,961	210	25.0	2.07	0.22
—30	....	7,980	1,266	227	38.7	6.95
0	....	17,936	3,560	774	183.8	44.45
30	....	35,500	8,040	2,147	612	185.4
..	....	....	....	4,800	1,605	566.2
..	....	....	....	11,760	4,410	1,836

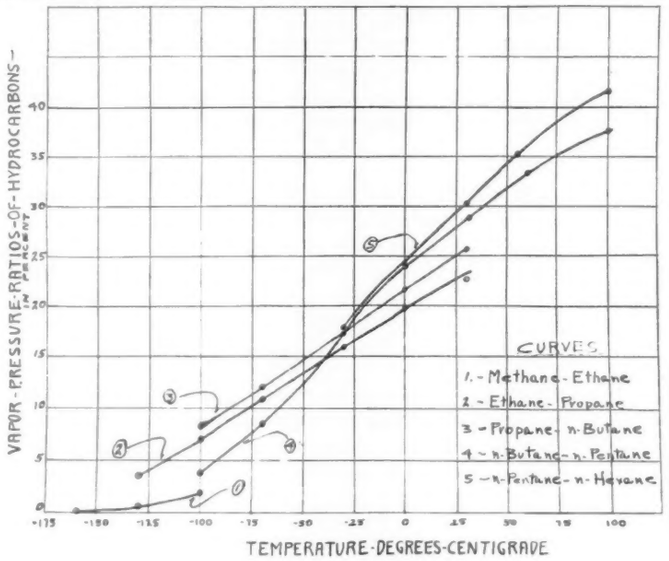

Figure 2—Per cent ratios of hydrocarbon vapor pressures.

Similarly, we may correct the boiling point of n-pentane by following its curve. The question now occurs how does the boiling point of a mixture of n-butane and n-pentane vary with pressure? A plausible hypothesis would be that the vapor pressure or boiling point curve of such a mixture would lie somewhere between the curves for n-butane and n-pentane and would be parallel to them. This is not strictly true but holds closely for a small pressure range as covered in this chart, and indeed we have no more accurate way of correcting boiling points of mixtures for pressure, without much more data than now available.

It is possible to make freak synthetic mixtures such as a solution of propane in decane, with no intermediate compounds present, the vapor pressure curve of which may not be parallel to the nearest vapor pressure curves and, in fact, will cross them; however, for a natural gasoline mixture this is a fairly accurate method of boiling point correction and especially so if the mixture is a narrow cut or fraction from a simple or fractional distillation. It may be shown by calculations from theory that the deviations are slight and the chart has been used for years very satisfactorily in correcting boiling points for vacuum distillations down to about 10 mm. to the standard pressure of 760 mm.

Similar boiling point correction charts extended to higher pressure range may be used for control of fractionating towers. For a uniform feed and reflux ratio, the fractionator may be operated at various pressures over a wide range to yield substantially the same kettle and overhead products if the kettle temperature is varied so as to follow the lines on the chart when plotted against the distillation pressure. Thus, if the kettle temperature is 28.0 degrees Centigrade at 760 mm. pressure in the fractionator, it should be raised to 35.6 degrees Centigrade for a pressure of 1,000 mm. to maintain the same kettle product composition. It will be found that the boiling points of the liquids on the fractionator trays and of the overhead product will also closely follow the lines on the chart.

Influence of Pressure

We shall now leave the correction of boiling points and take up another "odd-and-end," namely, the influence of pressure on the separation obtainable by vaporization of two or more hydrocarbons. It is generally accepted that the separation of hydrocarbons from their liquid mixture, in the sense that fractional distillation effects, it is improved with reduced pressure, but conflicting statements are current regarding the quantitative relation. How much does the separation improve with reduced

TABLE 3—CALCULATION OF VAPOR PRESSURE OF GASOLINE FROM ANALYSIS

Hydrocarbon—	% Liq. vol.	Sp. gr. 60°F.	Grams	Mol. wt.	Mols	Mols frac.	V.P. 60°F.	P.V.P.	% Vapor	Wt. % Liq.
Propane	2.1	.515	1.082	44.06	.02456	.02812	107.1	3.01	17.8	1.7
Iso-butane	8.3	.562	4.665	58.08	.08032	.09196	38.7	3.56	21.1	7.5
N-butane	25.0	.581	14.525	58.08	.25009	.28632	26.3	7.53	44.5	23.3
Iso-pentane	6.3	.625	3.938	72.10	.05462	.06253	9.46	.59	3.5	6.3
N-pentane	24.1	.632	15.231	72.10	.21125	.24185	6.99	1.69	10.0	24.4
Di-isopropyl	6.2	.666	4.129	86.11	.04795	.05490	3.07	.17	1.0	6.6
Iso-hexane	8.6	.666	5.728	82.11	.06652	.07616	2.00	.15	.9	9.2
N-hexane	12.0	.663	7.956	86.11	.09239	.10577	1.85	.20	1.2	12.7
Residue	7.4	.706	5.224	114.14	.04577	.05240	.15	.008	.04	8.4
	100.0		62.478		.87347	1.00000		16.91	100.0	100.0

The specific gravity is calculated to be .625 (dividing grams by 100 c.c.).

*Paper presented at annual meeting, California Natural Gasoline Association.

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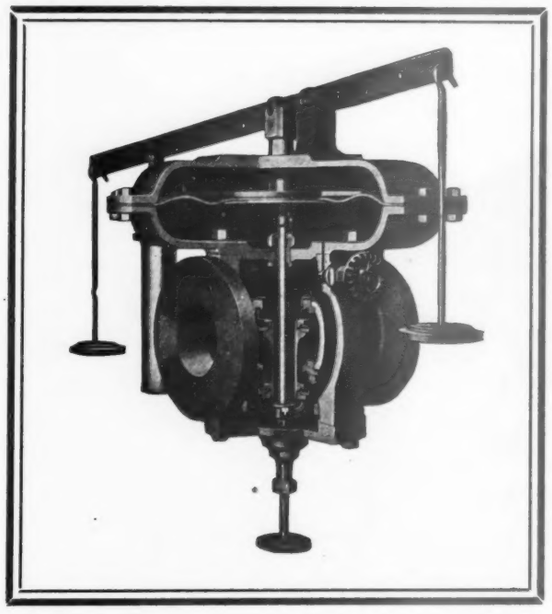

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pressure? It is fortunately a fairly simple matter to answer this question quite satisfactorily. Table 2 is a tabulation of the necessary data, selected from the technical literature, over the range of minus 160 degrees Centigrade to minus 100 degrees Centigrade. As it is difficult to arrive at conclusions merely from inspection of this table, a chart was prepared on the basis of this tabulation. Figure 2 shows the per cent ratios of the vapor pressures of hydrocarbons in pairs, Curve No. 1 being the per cent ratio of the vapor pressure of ethane to the vapor pressure of methane at the same temperature, Curve No. 2 being the per cent ratio of the vapor pressure of propane to the vapor pressure of ethane at the same temperature and so on. This per cent ratio is not in general the per cent of the more volatile hydrocarbon in the vapor—it is merely a comparison of the vapor pressures of two hydrocarbons assigning the value of 100 to the vapor pressure of the more volatile. The actual composition of the vapor from a mixture of the two hydrocarbons depends not only on the vapor pressures of the pure hydrocarbons, but also on their proportions in the liquid. However, in the special case where each hydrocarbon is present to the extent of 50 mol per cent, in a liquid mixture of two hydrocarbons the curves do represent the per cent of the less volatile hydrocarbon in the vapor above the liquid, and we may interpret the curves on this basis.

What Curves Show

Several interesting conclusions may be arrived at from inspection of the curves. In the first place, the proportion of the less volatile hydrocarbon in the vapor above the liquid increases with temperature in almost a straight line function for the temperature range covered by the chart. Therefore, the separation of hydrocarbons by vaporization, whether by simple distillation or fractional distillation, improves as the temperature, and therefore, the distillation pressure is lowered. The curves also give a measure of just how much the efficiency of separation will change upon a change in temperature—thus at a temperature of 0 degrees Centigrade the vapor above a binary mixture of n-butane and propane of equal molar proportions will contain about 78 per cent of propane, while at a temperature of 30 degrees Centigrade it will contain only 74 per cent of propane.

At a temperature of minus 100 degrees Centigrade this per cent will be about 92 per cent. It will be noted that at very low temperatures the separation is particularly effective especially in the case of methane and ethane, Curve No. 1, where at a temperature of minus 160 degrees Centigrade there will be only about one-tenth of 1 per cent of ethane in the vapor above the 50-50 per cent (mol per cent) mixture. While the separation of heavier hydrocarbons does not appear to be anywhere near as efficient at corresponding temperatures as that of ethane from methane, yet the trend of the curves as indicated by experimental data available indicates that this separation can be made fairly complete by going to very low temperatures.

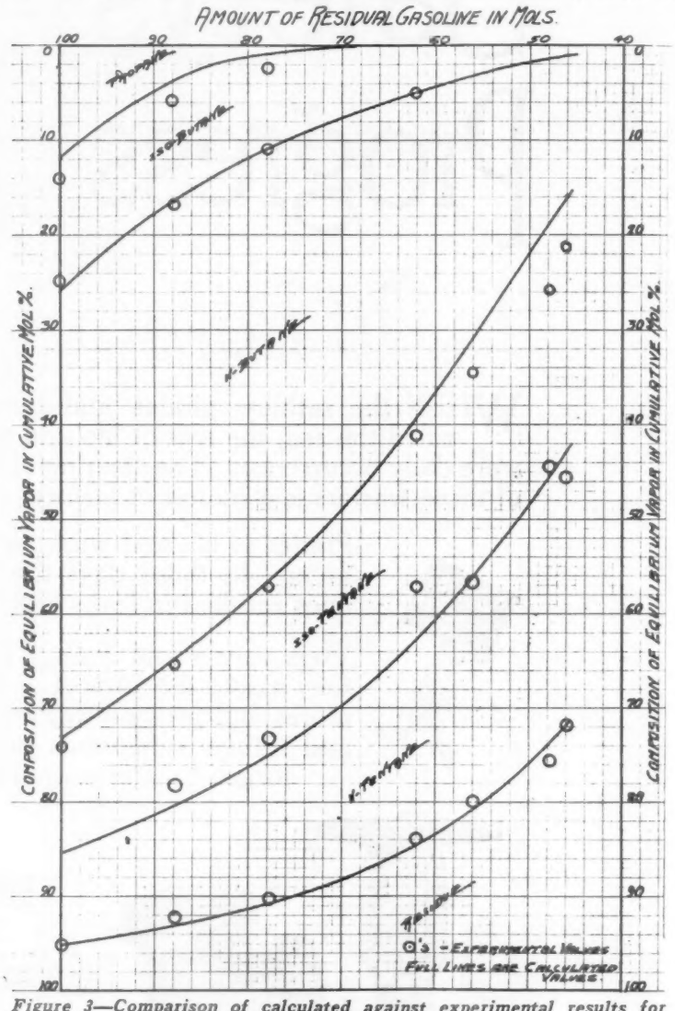
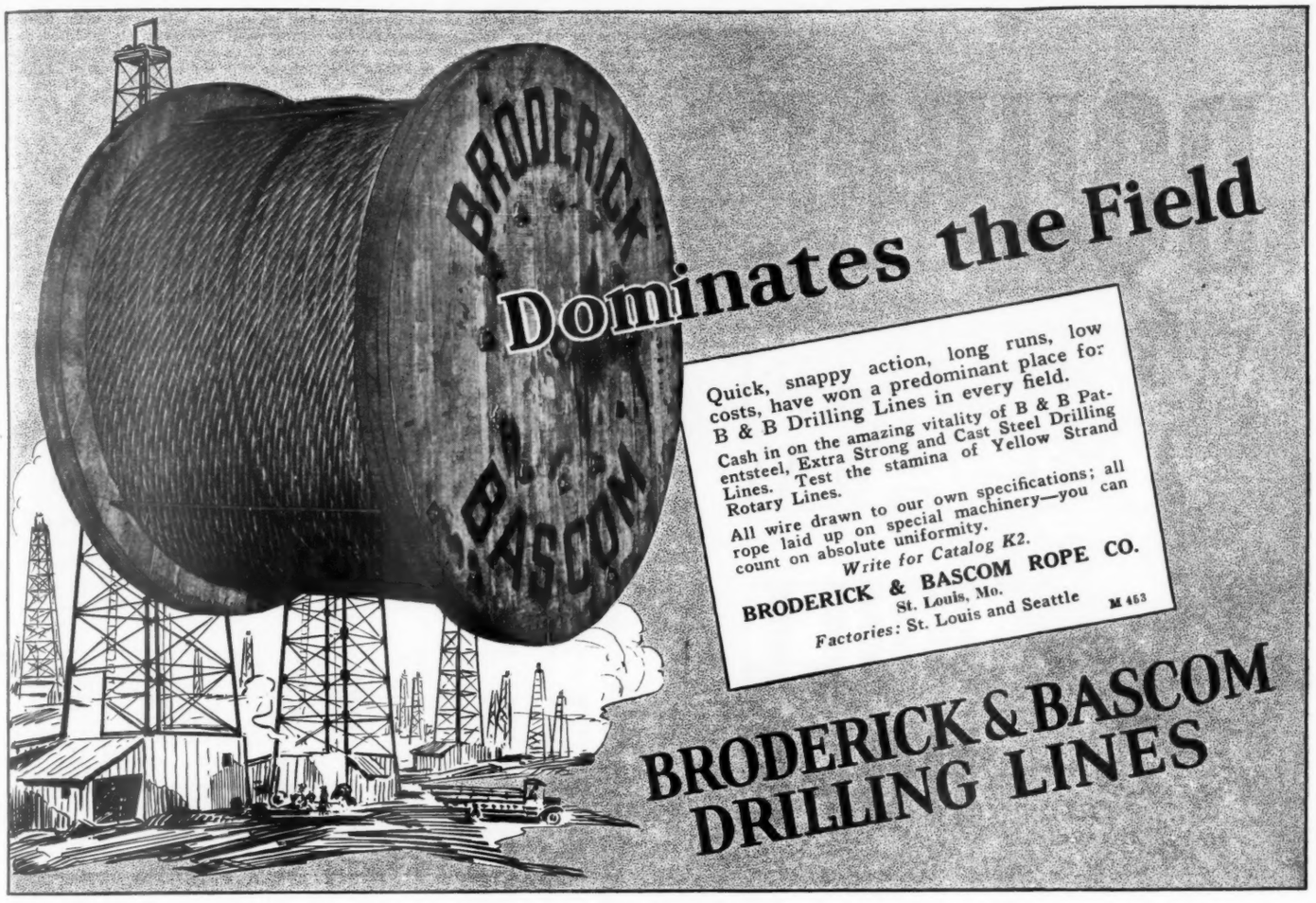


Figure 3—Comparison of calculated against experimental results for differential vaporization process.

Whereupon it may be suggested that this may be a means for analyzing a hydrocarbon mixture by progressively distilling its components at very low temperatures. There is, however, a joker in this situation which is evident when we extrapolate the curves shown by use of equations which had been worked out for the vapor pressures of these hydrocarbons, and find that it is necessary to run our laboratory distillations at pressures of a few millimeters or even fractions of a millimeter at liquid air temperature or even lower to gain such



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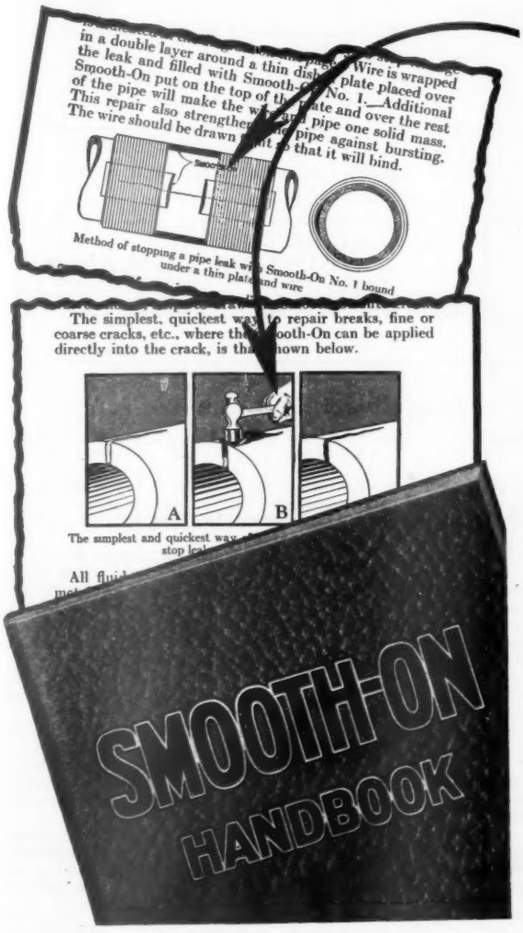
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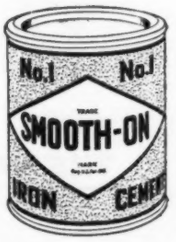

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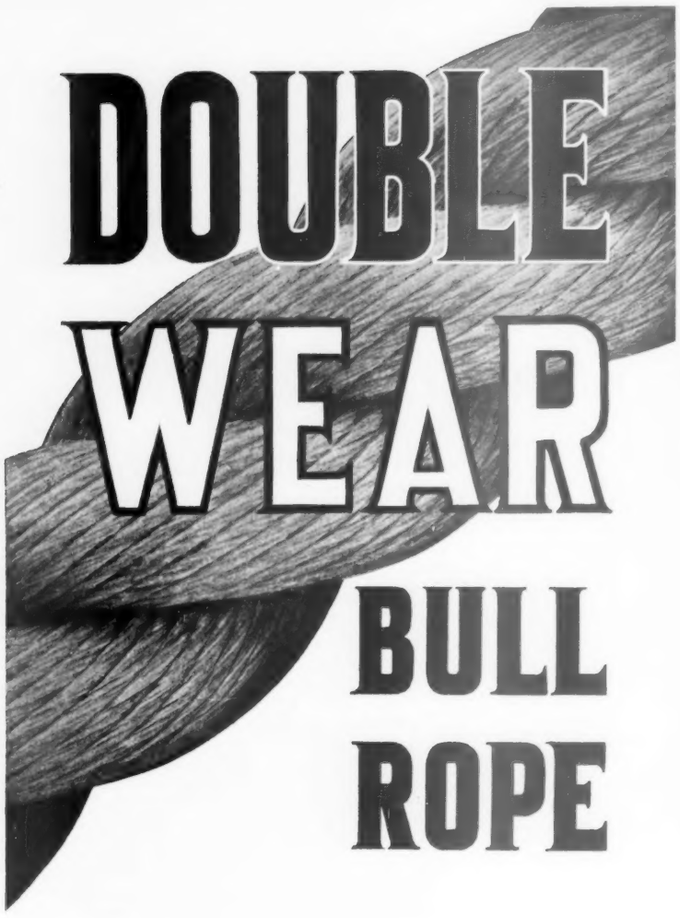

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quantitative separation of pentane from butane or hexane from pentane as the curves show possible for ethane from methane at a temperature of minus 160 degrees Centigrade.

However, it is possible to so conduct the distillation at temperatures and pressures still very low but above the boiling point of liquid air so that no more than two hydrocarbons will be present in substantial percentage in the vapor from the liquid at any time and binary mixture fractions may be taken off to be analyzed by some supplementary test which may now be applied to them such as slow combustion, determination of dielectric constant, or of specific gravity, etc., to determine the per cents of the hydrocarbons. This is in the main the principle of the Burrell and the Shepherd and Porter methods of analysis for natural gas by distillation of the liquefied gas at low temperatures and pressures.

The chart also explains a point brought up in a discussion of Mr. Hutchison's paper read at a previous meeting of this association on the effect of absorber oil

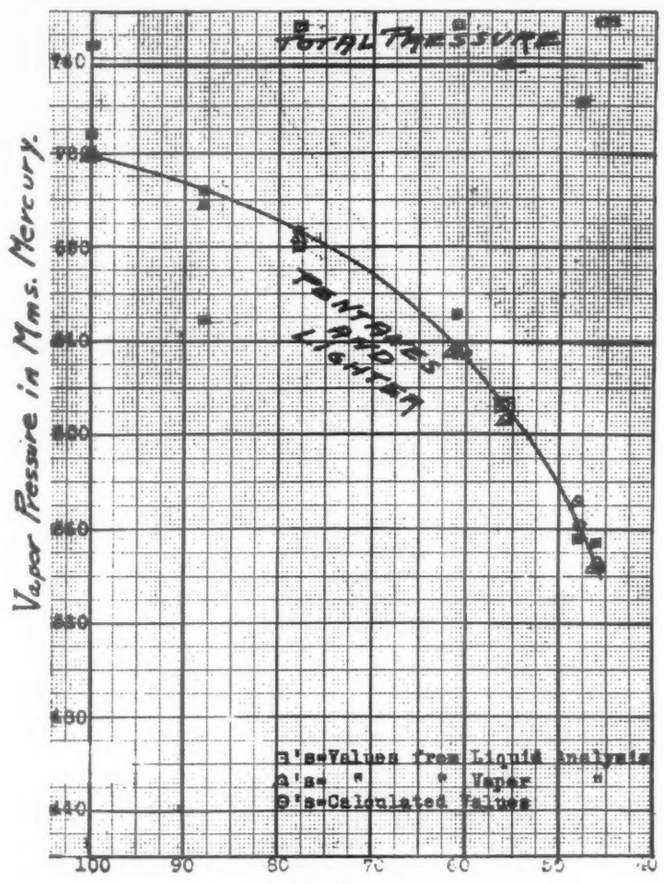

Figure 4—Comparison of observed and calculated vapor pressure of a gasoline.

temperatures on the efficiency of separation of propane from butanes. The statement was made that this separation improves at lower oil temperatures because the vapor pressure of butanes dropped more rapidly with lowering in temperature than the vapor pressure of propane and therefore propane has a greater tendency to escape from the oil at the lower temperatures. Curve No. 3 distinctly shows that the per cent of n-butane in the vapor from a 50-50 mol per cent mixture of propane and butane decreases with lowering in temperature and, therefore, the per cent of propane increases correspondingly.

Separation of Propane

Propane therefore is separated more effectively at lower temperature. A difference of 10 degrees Fahrenheit represents a change of about 1 per cent in the efficiency of propane extraction, from a 50-50 mol per cent mixture of butane and propane as assumed. This change in separation efficiency with temperature will, of course, be modified somewhat in amount by the actual percentage of propane and of the many other hydrocarbons in a gasoline-oil solution, and by the other variables entering an actual theoretical calculation of absorber performance. It must be pointed out here that the above conclusions as to separation efficiency at different pressures need not immediately lead to the wholesale scrapping of high-pressure fractionators.

The fractional distillation process, whether occurring in a laboratory glass column, or in a commercial fractionating tower, is an exceedingly complex play of many variables such as the amount of contacting of refluxed liquid with vapor, the ratio of condensed overhead product returned to the top of the column to the amount withdrawn as product, the efficiency of the thermal insulation of the column, the location of the feed point in the column, the composition of the feed, the per cent of the feed taken overhead and so on, among which the somewhat slow change in separation efficiency with temperature and pressure is practically lost in the shuffle as regards comparing low and high-pressure fractionators.

It is difficult to further refrain from mentioning Raoult's Law, which has been more or less implicit in all the discussion so far. It was stated at the beginning of this paper that the answer to certain questions on distillation was at once simple and involved. In so far as Raoult's Law furnishes such an answer it is most decidedly simple and complex at the same time. Raoult's Law is a very simple law for the calculation of the vapor pressure of a hydrocarbon from its solution from the analysis of the solution into individual hydrocarbons and from known physical constants for the hydrocarbons so determined. It states that the vapor pressure of a hydrocarbon in solution is not equal to its vapor pressure in the pure state, but is equal to its vapor pressure in the pure state

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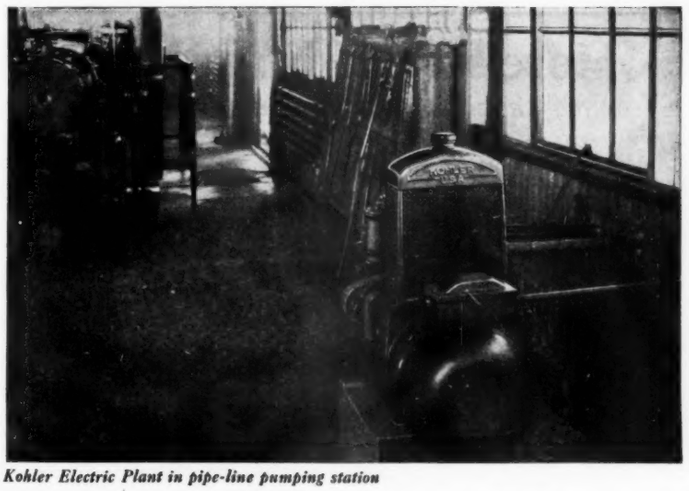

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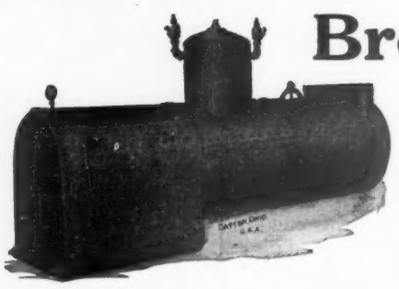

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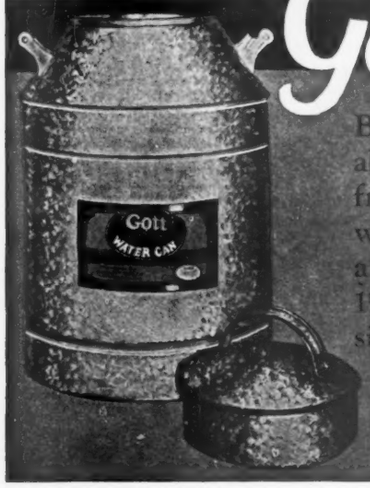

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multiplied by its mol fraction in the solution. Thus, although the vapor pressure of pure propane is 107 pounds per square inch at 60 degrees Fahrenheit, the vapor pressure of propane in a solution containing only 1 mol per cent of it, or .01 mol fraction will be 107 times 0.01 or 1.07 pounds per square inch which could readily be measured by a hypothetical vapor pressure determination test, which could be adjusted so as to measure only the vapor pressure due to propane and to disregard the vapor pressures of isobutane, n-butane and so on, the sum total of which yields the total vapor pressure of a solution.

Raoult's Law

In order to show how Raoult's Law may be applied to calculate the vapor pressures of the individual hydrocarbons or their so-called "partial" vapor pressures, since they are only "parts" of the total vapor pressure of the solution, there will be shown again a typical calculation from a natural gasoline analysis, Table 3, which was used in the presentation of a paper on physical constants of hydrocarbons at a previous meeting of this association. The analysis of the gasoline was made by a fractional distillation method for the analysis of natural gas and gasoline developed by the writer, and all of the gasoline except 7.4 per cent of nondistillable residue was distilled in an efficient fractionating column to obtain separation in the individual hydrocarbons shown.

The analysis gives the percentages of the hydrocarbons by liquid volume, and the calculation is conveniently based on 100 liquid c.c. at 60 degrees Fahrenheit.

The liquid c.c. of the individual hydrocarbons are therefore multiplied by the corresponding specific gravities (see Table 1) at 60 degrees Fahrenheit to yield weights in grams. The weights in grams are divided by the corresponding molecular weights for the hydrocarbons to obtain the number of mols of each hydrocarbon.

These mols are now summed up, and the number of mols of each hydrocarbon is divided by the sum total to yield the corresponding mol-fraction in the next column which differs from mol per cent by a factor of 100. The next column lists the vapor pressures of the pure hydrocarbons at 60 degrees Fahrenheit (Table 1). Since we now have the vapor pressures of the pure hydrocarbons, and their mol fractions, the stage is all set for the application of Raoult's Law and the act is accomplished by multiplying the two columns to yield "partial" vapor pressures in the next column. A study of this column will answer many questions as to the undue influence of propane and iso-butane in raising the vapor pressure of a gasoline.

According to Dalton's Law the per cents of gases in a mixture are proportional to their "partial" vapor pressures in the gas. We may therefore simply divide each partial vapor pressure shown in the P.V.P. column by the total pressure to obtain the per cent of the hydrocarbon in the vapor above and in equilibrium with the gasoline. When we talk of a vapor in equilibrium with a liquid we mean the vapor is at the same temperature and pressure as the liquid and has been given so much time for contacting with this liquid that the molecules of individual hydrocarbons such as propane or iso-butane in the liquid and in the vapor have established a sort of peace treaty, namely, as many molecules of propane jumping out of the liquid into the vapor per minute as molecules falling back—or, until the partial vapor pressure of propane in the liquid, as closely approximated in our calculation using Raoult's Law equals the partial vapor pressure of the propane in the vapor above the liquid.

Calculating Pressures

We may, therefore, calculate the partial vapor pressures of hydrocarbons in natural gasoline, the total vapor pressure, and the composition of the equilibrium vapor from analysis of the gasoline into individual hydrocarbons using proper physical constants. It may now be asked what justification is there for this use of Raoult's Law and what are the limits of accuracy in its application. The

Table 4—Material Balance in Mols for Single-Flash Experiment
(Basis, 100 Mols feed)

	From analysis of feed	From analysis of distillate and residue
N-butane	5.42	5.28
Iso-pentane	11.85	12.36
N-pentane	32.10	30.17
Iso-hexane	13.82	11.57
N-hexane	16.54	18.84
Residue	20.27	21.78
Total	100.00	100.00
Pentanes	43.95	42.53
Hexanes	30.36	30.41

Table 5—Comparison of Calculated Against Experimental Results of Single-Flash Experiment

	Vapor mol—per cent		Residue mol—per cent	
	Expt.	Calc.	Expt.	Calc.
C4-n	11.68	11.67	2.00	2.26
C5-i	17.86	18.47	9.54	8.44
C5-n	44.56	44.12	22.77	25.91
C6-i	12.59	12.30	11.05	14.61
C6-n	8.46	11.22	24.17	19.27
Res.	4.84	2.22	30.48	29.58
	100.00	100.00	100.00	100.00
C5-i/n	62.42	62.59	32.31	34.35
C6-i/n	21.05	23.52	35.22	33.88

hydrocarbons of the methane series occurring predominantly in natural gas and gasoline are very well-behaved as regards following rules and laws for ideal gas and liquid solutions and it has been assumed in a sort of gentleman's agreement by the natural gasoline industry that Raoult's Law would apply without serious deviation; direct experimental evidence was not, however, available, due to lack of proper methods of analysis to determine the hydrocarbons in the complex natural gasoline mixture.

The writer has recently made an investigation of the vaporization process as applied to natural gasoline with the purpose of:

1. Ascertaining experimentally the composition changes produced in various types of vaporization such as the simple flashing of a liquid mixture into a vapor and a liquid residue, and the simple or fractional distillation of a liquid mixture.
2. Developing methods of computation for calculating the composition changes for all vaporization or condensation processes taking place under known conditions, and
3. Ascertaining the limits of accuracy of Raoult's Law when used for such computations.

A full repart of this investigation was made at the American Chemical Society meeting at Swampscott, Mass. in September by Podbielniak and Brown and will be published shortly in the Journal of Industrial and Engineering Chemistry. The following is abstracted from this report:

Vaporization Process

Briefly, experiments were made in which natural gasoline samples were vaporized under carefully controlled conditions and samples taken for analysis of the vapor and liquid. The samples were analyzed using the apparatus and methods previously developed by the writer. Two distinct types of vaporization processes were studied, the single flash and the differential vaporization process. In the single flash experiments a sample of natural gasoline was fed into an apparatus which accomplished the same results as if the gasoline were allowed to partially vaporize into a large previously evacuated tank to a definite final pressure and temperature with all of the vapor formed in equilibrium contact with all of the nonvaporized residue. Several runs were made with this apparatus and the feed, the vapor formed and the nonvaporized residue were analyzed and material balances made on the individual hydrocarbons as a check on the experiment.

Table 4 shows such a material balance for one of the single-flash experiments. There is a satisfactory agreement of the composition of feed as determined by analysis of feed and by separate analysis of the vaporized and nonvaporized portions, considering that this material balance includes all the errors of the single-flash experiment. It will be noted that the agreement is particularly good for combined pentanes and combined hexanes.

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ment for which the material balance has just been presented, the composition of the vapor and of the nonvaporized residue were calculated. The calculation is based only on material balances for the individual hydrocarbon components analyzed, namely, n-butane, iso-pentane, n-pentane, etc., and on Raoult's Law. Since there is no error involved in the use of material balances, the comparison of the calculated compositions with those actually determined by analysis should furnish evidence on the limits of accuracy of Raoult's Law in this application. Table 5 gives the comparison of the experimental and calculated compositions in mol per cent for both the vapor and the nonvaporized residue. It will be observed that the agreement is as satisfactory as the material balance for this experiment and hence the deviations from Raoult's Law are at least within the experimental error involved.

In the study of differential vaporization process a sample of natural gasoline was vaporized very slowly in a specially designed apparatus at a constant pressure of 757 mm. so that equilibrium was practically obtained between the vapor and the liquid. All the variables of pressure, temperature, amount of liquid and others were carefully controlled and measured and vapor and liquid samples taken at frequent intervals for analysis. About 55 per cent of the sample of gasoline put in the apparatus was vaporized. From the results of this experiment charts were plotted showing the change in composition of the vapor and of the liquid as shown by analysis as more and more of the liquid was evaporated in this manner.

On the basis of the composition of the initial liquid in the apparatus and using the same value for pressure as actually used in the experiment, namely 757 mm. the entire change in composition of liquid and vapor was calculated on the basis of material balances and Raoult's Law. As the change in composition is here gradual and continuous unlike the single-flash experiment, the computation had to be conducted in small steps to accomplish the necessary integration and involved a different technic from that used for the single-flash calculation. As before, comparison of the experimentally determined with the calculated results should furnish a check on the validity of the methods of computation and on the limits of accuracy of Raoult's Law. Fagure 3 compares the experimental and calculated composition of the vapor above the liquid. In order to show the per cents of all the hydrocarbons analyzed on one chart, the composition was plotted in cumulative mol per cents, in this case equivalent to per cent by gas volume, against the amount of nonvaporized liquid in the apparatus referred to 100 mols. at the start of the experiment. The calculated per cents of the hydrocarbons are represented by the vertical distance between the full lines enclosing the corresponding areas. Thus the per cent of n-butane at the start of the experiment is 73 minus 26 or 47 per cent; the per cent of n-butane is seen to increase slightly and then to gradually lessen to only about 22 minus 2 or 20 mol per cent at 50 mols of gasoline left in the vaporizer of the differential vaporization apparatus.

Propane is seen to diminish very rapidly with the progress of vaporization as is also true for iso-butane while iso-pentane, n-pentane and the residue increases as the vapor becomes heavier. The circles represent the experimental values from analysis of the vapor samples and involve all the errors of experiment as well as of the analyses. Considering the complexity of the process thus studied experimentally and of the calculations necessary to reproduce it on the basis of theory, the agreement is satisfactory and indicates that Raoult's Law may be used for complicated calculations in the design of equipment for the natural gasoline industry and for similar purposes at least within the limits of accuracy required by such work.

Figure 4 shows the comparison of the total vapor pressure and of the partial vapor pressure for pentanes and lighter as determined experimentally and as calculated from gas and liquid analysis. The calculated total vapor pressure agrees with that actually measured within 1 to 2 per cent. In other words, from an analysis of gasoline for individual hydrocarbons through hexanes it is possible to calculate the total vapor pressure within 1 to 2 per cent, provided dissolved air is not present.

The full report of this investigation already referred to contains all the details of the methods and computation and their application to problems such as composition changes in the weathering, venting, distillation, and absorption of natural gasoline and the condensation of natural gas or gasoline vapor, and it is therefore not intended to include more of this material in the present paper than necessary to illustrate the application of Raoult's Law.

While this completes the list of odds and ends in the distillation of natural gasoline discussed in this paper a few words may not be out of place to encourage the more confident use of the fundamental principles of physical chemistry and of such calculations as mentioned in this paper in the natural gasoline industry. The apparent difficulty of such applications is due more to lack of familiarity with very simple laws such as Raoult's Law than to the complexity of the mathematics required. The hydrocarbons occurring in natural gas and gasoline are among the nicest and best-behaved chemical compounds we have as regards their obeying the laws of ideal gases and of ideal solution.

Their vapor pressure curves agree very well with each other. The vapors obey gas laws fairly closely and when they begin to deviate from them under certain conditions, the deviations follow some more simple laws as discussed in a previous paper by the writer.

What physical constants we do not have for the hydrocarbons may be closely estimated from theory. While there are deviations from Raoult's Law and other laws of ideal solutions, these are not great enough to affect the use of Raoult's Law within the accuracy required by the majority of the problems of the natural gasoline industry. There is great possibility for research and development along the lines mentioned.

WATERWAY COMPLETIONS WILL AID OIL MARKETING

(Continued from Page 166)

road freights, the statement is made by those in a position to know that owing to the shortness of the season, the necessity of large investments for storage and other conditions the cost is not very favorable to the use of tankers. The actual cost of transporting a single cargo by water is materially less than to transport the same quantity by rail, but this is an inadequate comparison. A tanker carrying 30,000 bbls. of petroleum product has practically 150 cars on board and to assemble and unload this quantity of material assumes the operation be carried on on a large scale.

The entire output of a refinery turning out 10 cars of gasoline a day for 15 days would be required to supply the tanker for a voyage which would be completed under ordinary circumstances in a week. The experience with the moving of other bulk material has proven that small shipments do not pay. For the successful operation of tank ships on the Great Lakes there must be a large refinery to furnish the material and a large distribution to distribute the refined product when it reaches its destination.

WIDENING DEMAND FOR SPECIAL MOTOR FUELS

(Continued from Page 166)

plaining that it is exactly the same thing and comes from the same refinery, but is cheaper because it is not sold under the brand mentioned and thus the motorist is not paying for advertising. To many motorists, to whom price is the paramount consideration, this type of gasoline appeals, but if such motorists were convinced that they were being misled as to the type of gasoline which they were get-

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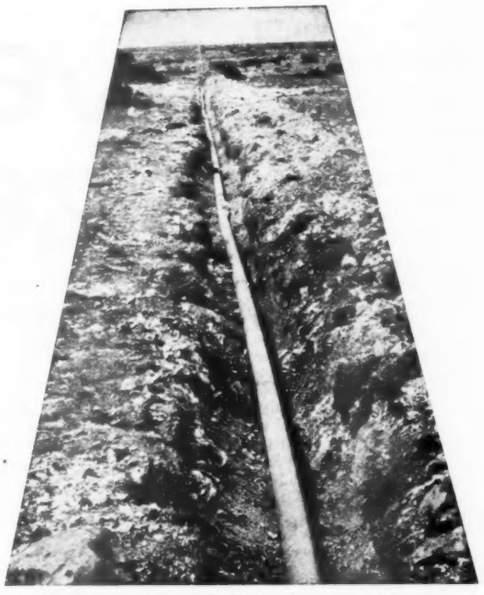

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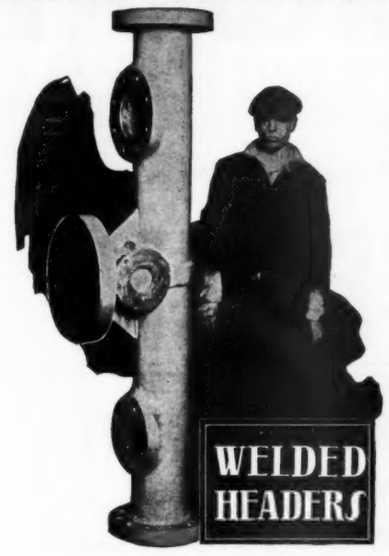

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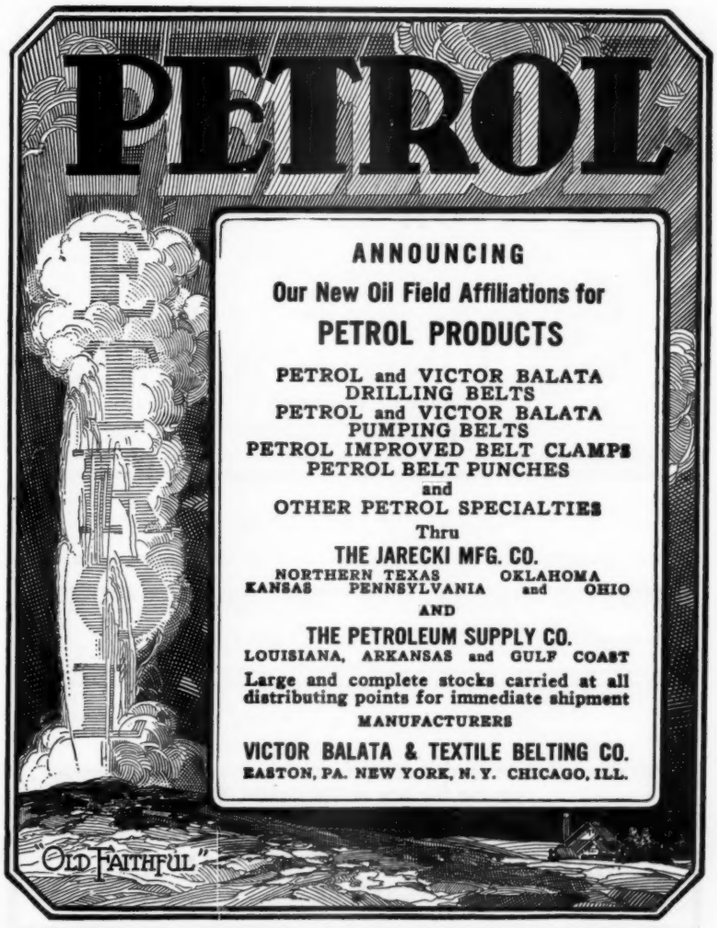

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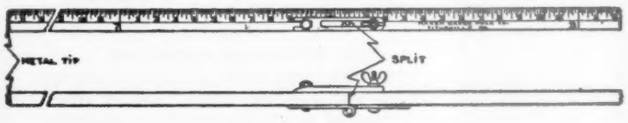

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ting, the volume of the stations handling the advertised brands would pick up.

Marketers in this area believe that by making the color of their special blends distinctive, and selling it through pumps entirely different in appearance from the ordinary type, they have at last found the solution to the problem of some of the type of competition mentioned in the preceding paragraph. Thus, for the first time, they have educated the consuming public to the point where motorists do not drive in and say "10 gallons" and let it go at that, but rather ask for 5, or 10 gallons, or whatever the quantity may be, of "Esso" or "H C." or "Ethyl" or "Socony Special" or whatever the preference of the individual motorists in special fuels may be.

Power of Brands

In addition, it is believed, marketing of the types of high quality gasoline and blends offers the individual refiners more opportunity to hold on to their filling station accounts once they have them signed up. The filling station operator with an established demand for "AAA" special motor blend, which he has recommended to his clientele as the finest gasoline available, is going to think twice before he shifts his account and takes on the "BBB" line of motor gasoline. Under present conditions, or rather, old conditions, a station operator could change brands at will and plausibly explain to his customers that the change made little difference, in as much as all of the representative refiners delivered a standard U. S. Motor quality gasoline, and that brands meant little. With the special blends, however, this phase of the business changes. Each blend on the market advances claims regarding its qualities, often differing radically from those of a rival blend, and generally claiming points of superiority over other qualities. For example, one type of special motor gasoline is boosted as the best kind to eliminate carbon in the motor; another will give quicker acceleration and quicker starting; still another will give the engine more power in low gear; while another is "a bear on hills," and so on. A motorist who has been buying a special blend to keep the carbon out of his engine is not particularly interested in another type which will give him quicker starting, but carbonizes, and if the station which he has been accustomed to buying his "anticarbon" gasoline from switches over to the quick starting blend, the customer is quite apt to switch over himself to some other station where he can get the type motor fuel he wants.

None of the large refiners in the East Coast area have yet announced any plans for special advertising and marketing drives on premium motor fuels for the 1929 season, but it is known that several have given consideration to the matter, and that preliminary plans are now being made for larger production of special motor blends during 1929, and consequently intensified sales and advertising activities.

Public Receptive

The task of further popularizing special gasolines is not a hard one for the refiner. The motoring public is in a receptive mood; it has already tried out the various new blends, and approves of them. The refiners can logically promote the sales of their premium fuels, not as something new or radically different, but as an improvement over the older type motor fuel, designed to keep pace with the various improvements which are being made in the newer model automobile engines.

The present type of publicity of many of the leading automobile manufacturers could not be more favorable for a campaign on special gasoline blends if it had been written by the advertising staffs of the oil companies themselves. While a few automobile manufacturers speak of their new type high-compression motors as being adaptable to any fuel on the market, and not necessarily requiring the premium fuel for most efficient operation, other automobile manufacturers declare that their new type engines have been designed primarily to utilize the higher grades of high-test gasolines which

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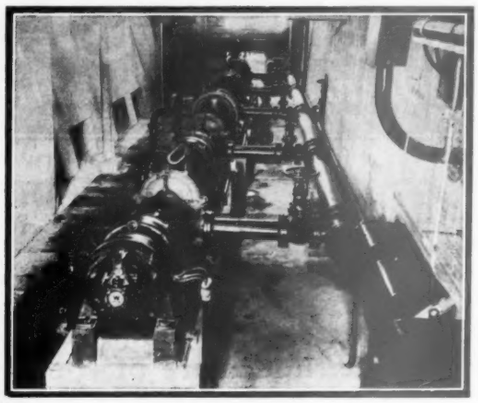

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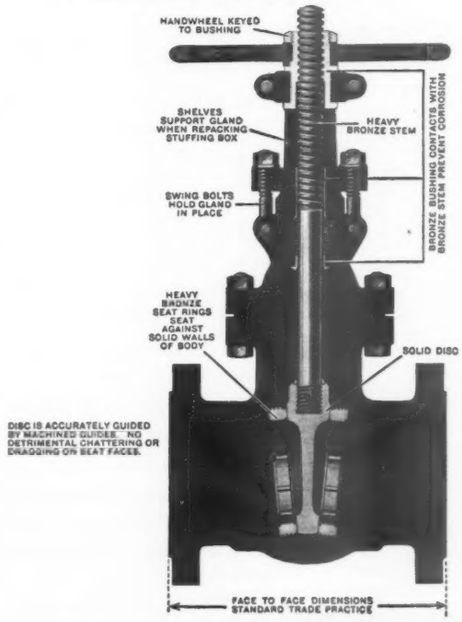
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the American oil industry is producing, and that the new engines, in combination with high-test motor fuels, give performance that cannot be equalled by the older types of motor cars, even utilizing high-test fuels, or high-compression motors using standard quality gasoline.

The influence of the mounting popularity of premium motor gasoline should be reflected in the earning statements of the companies which have been most active in pushing high quality motor fuels this season. While the premium fuels naturally cost more to produce, they are reported to show the refiners a reasonable margin of profit. When premium fuels first appeared on the market in East Coast territory a few years ago, the differential over the ordinary U. S. Motor grade was 5 cents per gallon, but this has since been scaled down to 3 cents, which premium now appears pretty well standard for all refiners. Dyeing of the special fuels, together with the necessary installation of additional pumps and tanks at filling stations, however, adds appreciably to the cost of distributing the new types of gasoline.

SEES GREAT BRITON AS LARGE BUYER

(Continued from Page 166)

now use oil-burning systems for household heating and that the introduction of these oil burners is progressing with startling rapidity. It was further brought out that while a few years ago a complete household burner installation to heat an eight or ten-room house cost approximately $1,000, at the present time the expenditure necessary is only about $550. It was stated that during the year 1928 approximately 42,000,000 bbls. of furnace oil would be consumed for domestic oil heating in the United States.

"It is estimated, as stated during the Fuel Conference in London, that the English use something like 40,000,000 tons of coal a year for household heating. This quantity of coal might be replaced by approximately 225,000,000 bbls. of oil, a business worthy of being developed not only for the oil burner

LEGAL

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Office of the Secretary
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The Secretary of the Interior invites sealed bids to be submitted at his office, Interior Department Building, Washington, D. C., on or before noon of December 10, 1928, for the royalty oil accruing to the United States from leases on Government land within the Salt Creek oil field in the State of Wyoming, for a period of three (3) years beginning January 1, 1929. For the calendar year 1927 the total Government royalty oil from the Salt Creek field amounted to approximately 1,920,000 barrels, and for the period from January 1 to August 31, 1928, to approximately 1,280,000 barrels, the average gravity in both years being in the range from 36.0 to 36.9 degrees A.P.I.

Bids must be based upon the highest posted field price for oil of like gravity in Oklahoma and Kansas, and or in Wyoming, whichever is the higher, and must be stated as a differential in cents per barrel from such posted price. Delivery of royalty oil will be made on each leasehold for the account of the successful bidder. Payments for the royalty oil are to be made to the Register of the United States Land Office at Cheyenne, Wyoming, on or before the fifteenth (15th) day of each month following that in which delivery is made and shall be computed on the basis of tank measurement with two (2) per cent strapping in terms of standard barrels at sixty (60) degrees Fahrenheit.

The successful bidder will be required to furnish a corporate surety bond in the sum of $250,000 conditioned upon full and complete compliance with the terms of the contract.

The Secretary of the Interior may accept any bid which in his judgment is most advantageous to the Government, and reserves the right to reject any or all bids.

Sealed bids are to be submitted to the Secretary, Department of the Interior, Washington, D. C., the envelope to be marked plainly, "Bid on Salt Creek royalty oil." No bids received after the time herein fixed for submitting bids will be considered.

Additional information can be obtained from the Geological Survey, Department of the Interior, Washington, D. C., or from the field offices of the Geological Survey at Casper, Wyoming.

ROY O. WEST,
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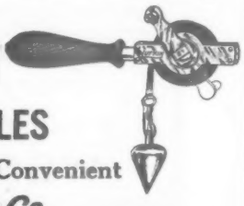

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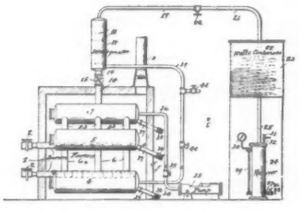
No Burners at Present

"So far as could be determined there is practically no use of household oil burner installations anywhere in Europe. However, there is no doubt that both in England and in Continental Europe modern heating systems will eventually be introduced. This being the case, is it not time for the oil burner industry to begin to enter these markets; to make installations in the homes of progressive people and to thus place object lessons in many communities showing the wonderful luxury of heating residences with oil? If this is done the people may begin to realize what they are missing. Starting with the homes of the well-to-do the usefulness of oil heating might then be readily demonstrated in smaller residences where economy is a matter of greater importance. As at the best it will be slow work to overcome the conservatism of Europe, the sooner a start is made, the greater hope we can have that within a few years there will be established abroad a market for our oil burners and for furnace oil.

"We can understand that in England the desire of the government to keep the English coal mines busy and to give employment to the miners will have a deterrent effect upon efforts to substitute oil for coal. But we also know that the English people enjoy home comforts and that they will have them in spite of any arguments that may be advanced against a change in method."

Recent Patents

1,670,105. Apparatus for Treating Hydrocarbons. Gustav Egloff and Harry P. Benner, Chicago, Ill., assignors to Universal Oil Products Co., Chicago, Ill., a corporation of South Dakota. Filed August 21, 1920, Serial No. 405,101. Renewed February 12, 1927. 4 Claims. (Cl. 196—106.)



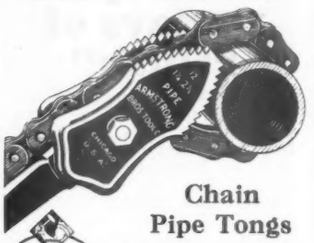
1. In an apparatus for cracking petroleum oil, the combination with a furnace, of means for heating the furnace to a cracking temperature, of a first pair of horizontal stills mounted in the lower part of the furnace, a second pair of horizontal stills mounted in the furnace and superimposed above said first pair, a single horizontal still in said furnace superimposed above and positioned between the stills of said second pair, means for delivering oil to said first pair of stills to substantially fill the same without filling the other stills, means connecting the first pair of stills with the superimposed stills whereby vapors from said first pair pass through and are superheated in said superimposed stills, a dephlegmator, connections from the single still to said dephlegmator, means for discharging uncondensed vapors from the dephlegmator, and means for return reflux condensate from said dephlegmator to one of said first pair of stills.

LEGAL

TRIBAL OSAGE OIL LEASES AT PUBLIC AUCTION, DECEMBER 11, 1928, BY UNITED STATES GOVERNMENT

December 11, 1928, at Pawhuska, Oklahoma, about 30,000 acres will be offered for oil leases in quarter section tracts. Bids will be for bonus in addition to royalties, 25% payable on day of sale, balance in three annual instalments, with acceptable security. Within advertised area there are about 9,870 wells producing from one barrel to 400 barrels each, the total daily production for August, 1928, being about 50,300 barrels; also, there are about 50 wells drilling. All lands are now leased separately for gas. Blue print maps of area advertised, showing tracts producing oil or gas, can be had for fifty cents each, also logs of producing oil or gas wells for twenty-five cents each well. Write U. S. Superintendent, Osage Agency, Pawhuska, Oklahoma, for maps, logs or other information.

ARMSTRONG



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Pipe Tongs

These tongs are built to give greater service. Handle is forged from high carbon steel—both stiffness and spring. Jaws are drop forged from special steel, treated, hardened and tested for toughness. The Bolt is extra large and the connecting link is drop forged from Chrome Nickel steel. Sizes for pipes from ⅛" to 18". Every Chain is Proof-tested to within ¼ of specified strength.

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TEXAS OIL MAPS
County and District Catalog on Application
HEYDRICK MAPPING COMPANY
Wichita Falls, Texas

An Article in Great Demand

The Martin-Loomis Corporation, Long Beach, California, writes under date of November 16, that after distributing a reprint of the article on Crooked Holes by R. Van A. Mills, petroleum engineering editor of The Oil and Gas Journal, which appeared in the issue of August 23, "we have had a great many requests for additional copies."

"This demand was so great that we found it necessary to have an extra five thousand printed and these are now about exhausted. These requests have come from all sorts of places, foreign and otherwise."

The Oil and Gas Journal is read in every oil field in the world because it covers every field and every activity in the industry thoroughly. Its technical articles are constantly being reprinted because back numbers of The Journal are usually unobtainable soon after publication.

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Oklahoma-Kansas and Eastern Pipe Line Report

OKLAHOMA-KANSAS
Pipe Line Statement for September

Runs

Company—	Month bbls.	Dly. av. bbls.
Prairie P. L. Co.*	4,425,000	147,500
Gulf P. L. Co.	1,543,157	51,439
Texas P. L. Co.	825,412	27,514
Magnolia P. L. Co.	2,021,613	67,387
Empire P. L. Co.	1,051,830	35,061
Cosden P. L. Co.	938,043	31,268
Sinclair P. L. Co.	3,546,000	118,200
Oklahoma P. L. Co.	3,627,300	120,910
Other lines	7,530,000	251,000
Total September	25,508,355	850,279
Total August	23,339,806	752,887
Difference	2,168,549	97,392

Shipments

Prairie P. L. Co.†	5,794,603	193,153
Gulf P. L. Co.	1,599,359	53,312
Texas P. L. Co.	1,058,939	35,298
Magnolia Pet. Co.	1,992,678	66,422
Empire P. L. Co.	1,056,498	35,217
Cosden P. L. Co.	730,643	24,355
Sinclair P. L. Co.†	3,414,431	113,814
Oklahoma P. L. Co.	3,433,505	114,450
Other lines	6,180,000	206,000
Total September	25,260,656	842,021
Total August	24,872,351	802,332

Stocks

Prairie O. & G. Co.	31,550,000
Prairie P. L. Co.	2,250,000
Gulf P. L. and Gypsy Oil Cos.	10,129,332
The Texas Company	6,778,513
Magnolia Pet. Co.	8,805,178
Empire P. L. Co.	3,649,650
Mid-Continent Pet. Corp.	3,552,713
Sinclair Crude Oil Pur. Co.	20,000,000
Carter Oil Co.	12,091,810
Oklahoma P. L. Co.	3,085,616
Other lines	11,500,000
Total September	113,392,812
Total August	112,768,329
Difference	624,483

*Estimated. †Prairie P. L. shipments include Texas crude oil and Sinclair shipments include Texas and Wyoming crude oil.

NOTE—Stocks do not include approximately 8,200,000 bbls. of crude oil held in storage on private tank farms and leases and approximately 250,000 bbls. of Texas Panhandle crude oil in storage in Oklahoma.

EASTERN PIPE LINE REPORT

Runs From Wells

In the following table will be found the regular receipts from wells by various pipe lines in New York, Pennsylvania, West Virginia, Ohio, Kentucky and Indiana for September and October:

	Sept. '28	Oct. '28
Nat. Transit	157,168.79	172,463.66
S. W. Pa. P. L.	81,070.62	94,478.66
Eureka P. L.	345,505.60	400,695.98
Buckeye P. L. (Macksburg)	321,117.10	363,769.46
Buckeye P. L. (Cleveland)	11,281.62	13,134.12
Buckeye P. L. (Lima, etc.)	108,830.90	119,271.80
Indiana P. L.	6,387.52	7,592.34
Cumberland P. L.	193,343.46	217,927.04
N. Y. Transit	23,100.70	26,945.74
Tidewater P. L.	204,507.93	223,123.30
Pure Oil	59,111.90	64,772.84
Emery P. L.	57,782.02	62,569.80
Paragon Dev.	26,168.86	24,640.17
Stoll Oil Ref.	9,243.26	9,609.59
Total	1,604,620.28	1,800,994.50
Daily average	53,487.34	58,099.79

Note—Indian Refining Co. also reported other receipts of 355,064.74 bbls. Paragon Refining Co. had other receipts of 203,578.08 bbls. Paragon Development had other receipts of 240.41 bbls.

Petroleum Deliveries

The following tables exhibit the shipments or regular deliveries of various pipe lines in New York, Pennsylvania, West Virginia, Ohio, Kentucky at the close of September and October:

	Sept. '28	Oct. '28
Nat. Transit	532,771.70	528,778.26
S. W. Pa. P. L.	481,986.45	491,708.37
Eureka P. L.	213,103.59	228,824.47
Buckeye P. L. (Macksburg)	142,859.81	139,624.01
Buckeye P. L. (Cleveland)	1,697.10	2,425.85
Buckeye P. L. (Lima, etc.)	1,399,448.58	1,424,886.12
Indiana P. L.	1,379,998.87	1,426,003.87
Cumberland P. L.	297,672.12	221,498.45
N. Y. Transit	240,697.91	278,273.65
Northern P. L.	301,912.35	130,832.45
Tidewater P. L.	124,606.05	183,550.90
Pure Oil	62,090.54	109,074.40
Emery P. L.	61,266.58	59,853.71
Paragon Ref.	190,716.50	203,968.74
Indian Ref.	366,303.28	.....
Paragon Dev.	27,004.95	26,688.69
Total	5,824,136.38	5,455,991.94
Daily average	194,137.88	175,999.74

Indian Refining Co. reported other deliveries of 350,851.15 bbls.

Gross Stocks

The gross stocks held by various pipe lines in the oil-producing sections of New York, Pennsylvania, West Virginia, Ohio, Indiana and Kentucky and Indiana for September and October:

	Sept. '28	Oct. '28
Nat. Transit	1,034,508.62	971,530.85
S. W. Pa. P. L.	607,019.77	674,433.72
Eureka P. L.	1,144,172.16	1,049,306.93
Buckeye P. L. (Macksburg)	507,516.69	496,344.46
Buckeye P. L. (Cleveland)	42,976.72	41,437.91
Buckeye P. L. (Lima, etc.)	3,600,695.49	3,428,238.49
Indiana P. L.	602,500.63	591,505.91
Cumberland P. L.	511,311.43	504,787.65
Southern P. L.	414,022.54	433,685.28
N. Y. Transit	612,289.36	494,456.24
Northern P. L.	424,456.32	429,822.34
Pure Oil	64,141.86	14,039.00
Emery P. L.	9,373.75	11,502.07
Paragon Ref.	16,042.95	15,313.80
Indian Ref.	61,936.95	66,957.25
Paragon Dev.	7,944.96	6,347.21
Total	9,660,910.34	9,229,709.11
Decrease	575,832.69	431,201.23

Grades of Oil

The following table shows the amount of the different grades of oil held by the Eastern Pipe Lines at the close of September and October showing the gross stocks of the above fields:

	Sept. '28	Oct. '28
Pennsylvania	3,227,574.95	3,121,156.66
Lima	969,628.64	977,037.03
Kentucky	831,752.66	799,724.03
Mid-Continent	4,560,201.79	4,278,220.12
Illinois	71,752.30	53,571.27
Total	9,660,910.34	9,229,709.11

Daily Average Runs

The following table shows the daily average runs of the Pennsylvania, Lima and Kentucky oil fields for the past four years:

	1925	1926	1927	1928
Jan.	56,831	55,630	56,209	52,904
Feb.	60,606	60,394	61,298	57,002
Mar.	60,575	61,644	63,247	57,485
April	63,062	63,019	60,337	56,812
May	59,217	60,580	60,284	52,067
June	61,270	61,131	62,757	55,220
July	62,639	63,206	58,674	57,144
Aug.	59,686	61,815	60,870	57,745
Sept.	62,510	64,639	60,285	53,487
Oct.	145,388	161,132	147,030	58,100
Nov.	59,350	61,774	57,215	.....
Dec.	57,974	58,755	53,089	.....

Daily Average Shipments

The following table gives daily average shipments from the Pennsylvania, Lima and other fields for the past four years:

	1925	1926	1927	1928
Jan.	157,889	156,056	141,227	146,465
Feb.	160,863	159,488	138,534	167,368
Mar.	154,891	150,239	133,777	158,883
April	151,429	152,371	140,227	172,935
May	146,995	160,998	144,594	180,559
June	149,467	160,257	149,772	188,034
July	161,338	160,045	151,850	189,470
Aug.	161,730	151,929	188,653	192,853
Sept.	156,719	158,915	144,213	194,138
Oct.	145,388	161,132	147,036	176,000
Nov.	143,582	152,608	150,975	.....
Dec.	150,162	136,428	144,504	.....

Gross Stocks

In the following table will be found the gross stocks of the various lines of the Pennsylvania, Lima and Kentucky oil fields, including oil received from other lines at the close of each month for the past three years:

	1926	1927	1928
January	9,859,170	9,718,008	12,276,710
Feb.	9,579,354	10,119,162	12,180,419
Mar.	9,438,292	10,794,044	12,239,725
April	9,805,851	11,112,295	11,740,125
May	9,531,757	11,359,381	11,602,468
June	9,585,904	11,493,673	11,287,678
July	9,734,687	11,455,128	10,819,231
Aug.	9,058,947	11,989,115	10,236,742
Sept.	9,436,732	12,212,716	9,660,910
Oct.	9,269,806	12,047,661	9,229,709
Nov.	9,257,067	11,939,750	.....
Dec.	9,454,512	12,340,297	.....

Franklin Pipe Line Co.

The following table exhibits the condition of the Franklin Pipe Line at the close of business for the months named and not counted in the stocks and averages reported above:

	Runs	Shipments	Stocks
1927—			
Sept.	3,309.56	2,656.48	19,372.25
Oct.	2,801.32	1,226.90	20,946.58
Nov.	1,746.50	2,220.53	31,472.55
Dec.	2,779.86	1,893.69	22,358.72
1928—			
Jan.	1,885.06	2,424.79	21,819.99
Feb.	2,460.14	3,109.34	21,170.79
Mar.	2,578.86	3,540.33	20,209.32
June	3,153.68	2,779.03	17,922.58
July	2,902.50	3,628.02	17,197.06
Aug.	2,874.11	2,350.13	17,721.04
Sept.	2,820.31	5,255.42	15,285.03

The Illinois Field

The following table gives the report of the Illinois Pipe Line Co. in Illinois:

Gross stocks, November 1	2,060,894.29
Runs from wells	596,689.22
Other receipts	392,025.54
Regular deliveries	546,793.54
Other deliveries	443,881.36

The amount of Illinois oil run by the Tidewater Pipe Co. in October was 29,458.42 bbls. Deliveries were 79,486.86 bbls. Adding these figures to those of the Illinois Pipe Line Co. makes the runs and deliveries as follows:

	Runs	Deliveries
1927—		
October	601,099.25	403,287.58
November	605,621.14	415,185.06
December	577,321.25	397,176.07
1928—		
January	561,759.57	434,147.00
February	573,619.78	450,217.81
March	725,250.82	520,595.69
April	526,013.13	448,282.44
May	632,968.64	522,980.51
June	608,552.49	625,087.33
July	612,286.49	565,678.37
August	639,074.85	671,864.02
September	570,307.91	737,293.50
October	626,147.64	626,290.40

Tidewater Pipe Co., Ltd., also delivered in September 261,905.21 bbls. Oklahoma oil.

AVERAGE DAILY RECEIPTS OF CALIFORNIA OIL AT ATLANTIC AND GULF COAST PORTS

Average bbls. per day—	ATLANTIC PORTS						GULF COAST PORTS					
	Baltimore	Boston	New York	Philadelphia	Others	Total	Galveston	New Orleans Baton Rouge	Port Arthur Sabine Pass	Tampa	Total	Total all ports
April	9,033	9,167	24,133	18,167	7,867	66,367	.....	.....	.....	.....	.....	66,367
May	19,355	5,387	19,581	16,419	4,774	65,516	.....	.....	.....	.....	.....	65,516
June	11,800	.....	23,367	19,700	9,000	63,867	.....	.....	.....	.....	.....	63,867
July	19,807	2,903	8,774	20,419	2,453	54,355	.....	.....	.....	.....	.....	54,355
August	18,161	3,613	27,774	17,677	2,419	69,645	.....	.....	.....	.....	806	70,451
September	11,100	.....	18,967	38,200	6,700	74,967	.....	.....	.....	.....	.....	74,967

AVERAGE DAILY IMPORTS OF PETROLEUM AT PRINCIPAL UNITED STATES PORTS

Average bbls. per day—	ATLANTIC PORTS						GULF COAST PORTS					
	Baltimore	Boston	New York	Philadelphia	Others	Total	Galveston	New Orleans Baton Rouge	Port Arthur Sabine Pass	Tampa	Total	Total all ports
April	18,267	5,800	124,133	33,200	36,067	217,467	9,333	23,467	2,167	133	35,100	252,567
May	28,000	7,033	107,484	32,129	21,936	196,581	3,871	24,032	.....	1,904	29,807	226,388
June	24,900	12,233	119,867	41,667	19,300	217,967	1,833	15,567	2,167	.....	19,567	237,534
July	23,484	14,548	111,903	37,678	21,452	209,065	9,355	25,000	.....	774	35,129	244,194
August	25,290	16,323	123,226	21,613	7,194	193,646	.....	38,677	.....	613	39,290	232,935
September	22,933	19,100	110,467	30,700	14,333	197,533	6,367	41,300	6,333	1,667	55,667	253,200

GROSS PRODUCTION IN UNITED STATES FOR 12 MONTHS

(In barrels of 42 gallons)

		California	Oklahoma	Texas	Kansas	Arkansas	Louisiana	Rocky Mountains	Eastern Fields	Total
October:	Month	19,448,893	24,247,053	19,200,093	3,509,169	3,117,298	3,058,889	2,258,885	3,400,000	77,240,285
	Daily average	627,384	782,163	619,358	113,199	100,555	66,416	72,867	109,677	2,491,622
November:	Month	18,516,467	23,083,380	18,628,290	3,313,650	2,906,760	1,956,960	3,234,730	3,302,500	73,942,737
	Daily average	617,216	769,446	620,943	110,455	96,892	65,232	74,491	110,083	2,464,758
December:	Month	18,938,823	23,208,417	19,840,009	3,427,174	2,962,750	1,927,148	2,400,578	3,219,900	74,924,799
	Daily average	610,930	748,400	640,000	110,554	95,576	62,166	77,438	103,868	2,416,926
January:	Month	19,028,228	20,978,320	20,024,981	3,319,325	2,791,922	1,805,015	3,429,275	3,133,000	73,510,166
	Daily average	613,814	676,720	645,967	107,075	90,061	58,226	78,367	101,064	2,371,296
February:	Month	18,038,459	19,294,426	19,645,488	3,079,887	2,571,575	1,759,806	2,230,887	3,166,000	69,786,228
	Daily average	622,016	665,324	677,431	106,203	88,675	60,676	76,927	109,173	2,406,428
March:	Month	19,118,320	20,162,524	21,466,632	3,379,031	2,687,948	1,871,158	2,401,911	3,522,000	74,609,524
	Daily average	616,720	650,404	692,472	109,001	86,708	60,360	77,481	113,613	2,406,759
April:	Month	18,280,729	19,096,920	21,845,428	3,412,260	2,472,600	1,915,020	2,370,810	3,231,000	72,624,767
	Daily average	609,357	636,564	728,180	113,742	82,420	63,835	79,027	107,700	2,420,826
May:	Month	19,331,866	19,443,355	21,191,561	3,367,809	2,843,847	1,928,036	2,525,043	3,619,000	74,248,517
	Daily average	623,609	627,205	683,599	108,639	91,737	62,130	81,454	116,742	2,395,113
June:	Month	19,164,244	18,482,981	19,802,520	3,202,050	3,075,911	2,112,149	2,425,470	3,394,000	71,659,325
	Daily average	638,808	616,099	660,084	106,735	102,530	70,405	80,849	113,133	2,388,644
July:	Month	19,754,458	18,809,498	22,155,335	3,171,548	2,792,139	2,237,738	2,492,586	3,472,000	74,885,302
	Daily average	637,241	606,758	714,688	102,308	90,069	72,185	80,406	112,000	2,415,655
August:	Month	19,444,849	20,840,494	22,201,257	3,147,058	2,711,787	2,221,677	2,561,840	3,571,200	76,700,212
	Daily average	627,255	672,274	716,170	101,518	87,477	71,667	82,640	115,200	2,474,200
September:	Month	18,908,169	22,456,860	21,554,260	3,047,260	2,540,070	1,829,625	2,432,430	3,420,000	76,188,664
	Daily average	630,272	748,562	718,475	101,575	84,669	60,987	81,081	114,000	2,539,621
	Total 12 months	227,973,555	249,104,228	247,555,859	39,376,211	33,474,607	23,621,023	28,764,545	40,450,600	890,320,628
	Daily average	622,878	680,613	676,382	107,585	91,461	64,538	78,593	110,521	2,432,570

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Byron-Jackson, Inc.
2301 E. Vernon Avenue, Los Angeles, California

Factory Representatives: Tulsa, Okla., 409 Atlas Life Bldg. Big Spring, Tex., 15 New Lester Fisher Bldg. Houston, Tex., 2201 Breckenridge St. Fort Worth, Tex., 614 Dan Waggoner Bldg.

Advertisers' Index on Page 25 Table of Contents on Page 26

HEADQUARTERS of a Trail-Maker !

HERE is a part of the fleet of one of the most successful of Oklahoma oil companies.

The trucks on the center stage are . . . on Goodrich "Oil Field Special" Silvertowns.

All-round . . . all four wheels . . . and spare.

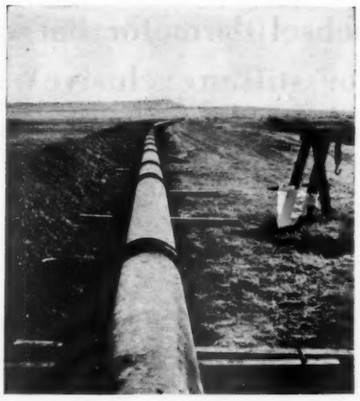
And the "scouts" on standard Silvertowns.

Nothing can stop this Silvertown combination—nothing in the whole wide state of Oklahoma. For Goodrich put into "Oil Field Special" Silvertowns everything it ever knew about tread traction and carcass strength. And it overlooked no bets!

If you want to lead the parade to fortune, put your trucks on "Oil Field Specials."

THE B. F. GOODRICH RUBBER COMPANY
Est. 1870 Akron, O. Pacific Goodrich Rubber Co., Los Angeles, Calif. *In Canada:* Canadian-Goodrich Co., Kitchener, Ont.

Goodrich
OIL FIELD SPECIAL
HEAVY DUTY
Silvertowns



Walworth Iron Body Valves furnished on the Amarillo Pipe Line

All sizes, all pressures, and all for the same job

The Amarillo-Denver Natural Gas Line

"Walworth Valves throughout" were selected for this 400-mile pipe line which carries natural gas from the producing field in the Texas Panhandle to the industrial and domestic consumers of Pueblo and Denver. They will control the flow of gas in this gigantic system for many years to come. (The small illustration shows the actual size of the pipe.)

Walworth valves were selected because of their rugged strength and superior design. With the complete line of Iron, Brass and Steel valves and fittings, Walworth offers to oil and gas men a complete unified responsibility for satisfactory service.

Call on our Engineering Products Division for further information.

WALWORTH

Walworth Company, General Sales Offices: 51 East 42nd St., New York
Plants at Boston, Mass.; Kewanee, Ill.; Greensburg, Pa., and Attalla, Ala.

Distributors in Principal Cities of the World

Walworth Limited, 10 Cathcart St., Montreal, P. Q.

Walworth International Co., 11 Broadway, New York, Foreign Representative

The Oil and Gas Journal, issued weekly by The Petroleum Publishing Company, 114-116 West Second Street, Tulsa, Oklahoma. Subscription price $6.00 a year; 15 cents a copy. Entered as second-class mail matter December 15, 1911, at the post office at Tulsa, Okla., under the Act of March 3, 1879

A. C. Motor Pioneers

Wagner made the first commercially successful single-phase; starterless; unity power-factor; directed-draft, and air-jacketed motors, . . . as well as the Fynn-Weichsel (the motor that regulates power-factor) still an exclusive Wagner product.

Making every type of motor, Wagner engineers can be impartial in their recommendations.

Literature on request

WAGNER ELECTRIC CORPORATION
6400 Plymouth Avenue, St. Louis, U. S. A.

Wagner Sales Offices and Service Stations in 25 Principal Cities

Products: FANS . . . . Desk, . . Wall . . and Ceiling
TRANSFORMERS . . . Power, Distribution and Instrument
MOTORS . . . Single-phase, Polyphase and Direct Current

Wagner ... quality

61-7631-2

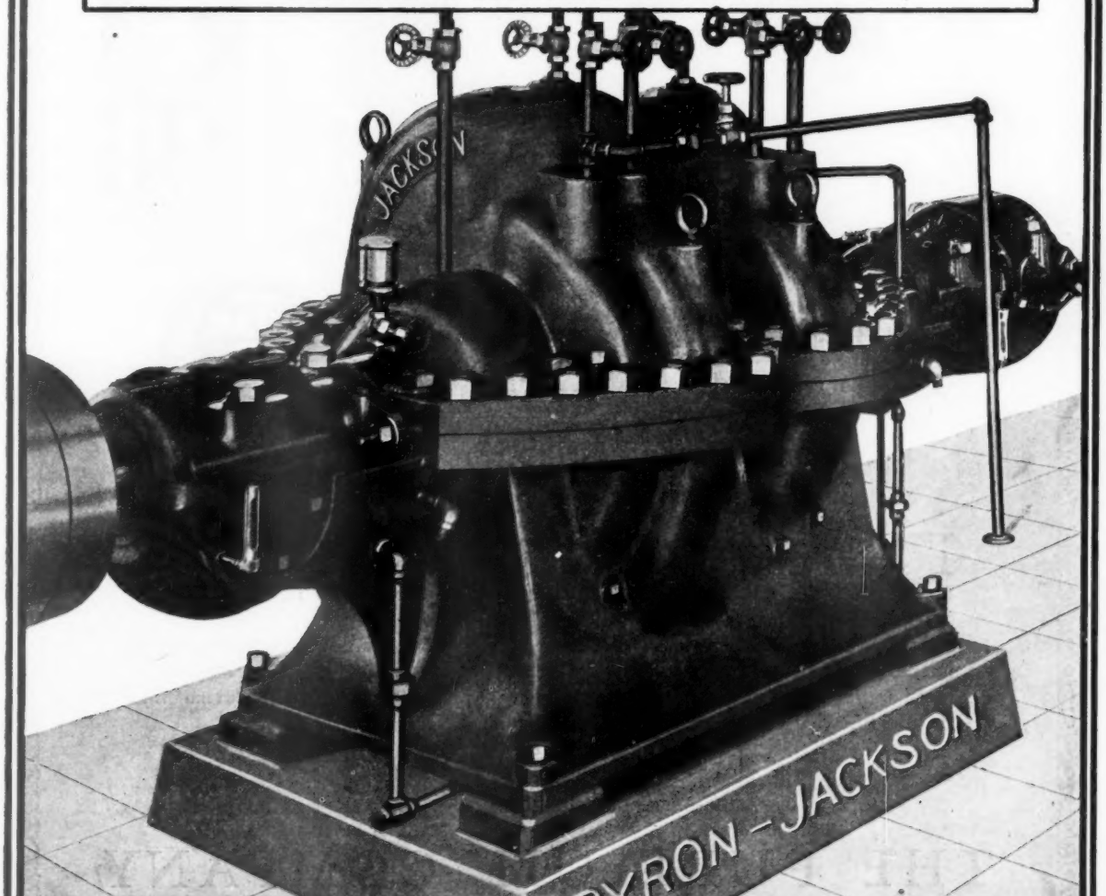
PROVEN

This Byron Jackson centrifugal pipe line pump is the symbol of revolutionary accomplishment in the oil industry. Many oil companies have proved its superiority by the most severe tests ever imposed on any type of pump.

BYRON JACKSON PUMP MFG. CO.

Factories: BERKELEY, Los Angeles, Visalia

Branches: San Francisco, Portland, Salt Lake, Dallas, Phoenix



BYRON JACKSON

CENTRIFUGAL PUMPS FOR EVERY SERVICE

The "*Will and the Way*" to Refine Well

IF you were to refine your *own* products, you could use no greater care than Pure Oil uses in refining them *for* you.

And Pure Oil not only has the will to refine well — it has the way. Great modern refineries containing only the most approved equipment . . . expert refining knowledge — the result of thirty years' experience! This company makes all petroleum products as only an organization with such vast facilities and experience *can* make them.

And because The Pure Oil Company controls *every* step in producing and refining its products, you are assured of *uniform* quality . . . delivery on the dot.

Mr. Jobber: Pure Oil has a complete line of quality petroleum products. We're ready to ship what you want when you want it. Just phone, write or wire nearest Sales Office.

THE PURE OIL COMPANY

U. S. A.

One of the major producing, refining and marketing companies—yet strictly independent

REFINERIES:

Marcus Hook, Pa.
Cabin Creek Jct., W. Va.
Heath, Ohio
Ardmore, Okla.
Muskogee, Okla.
Smith's Bluff, Texas

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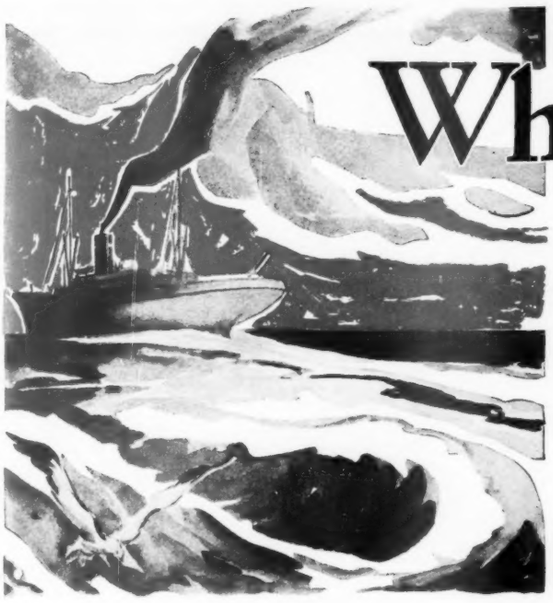
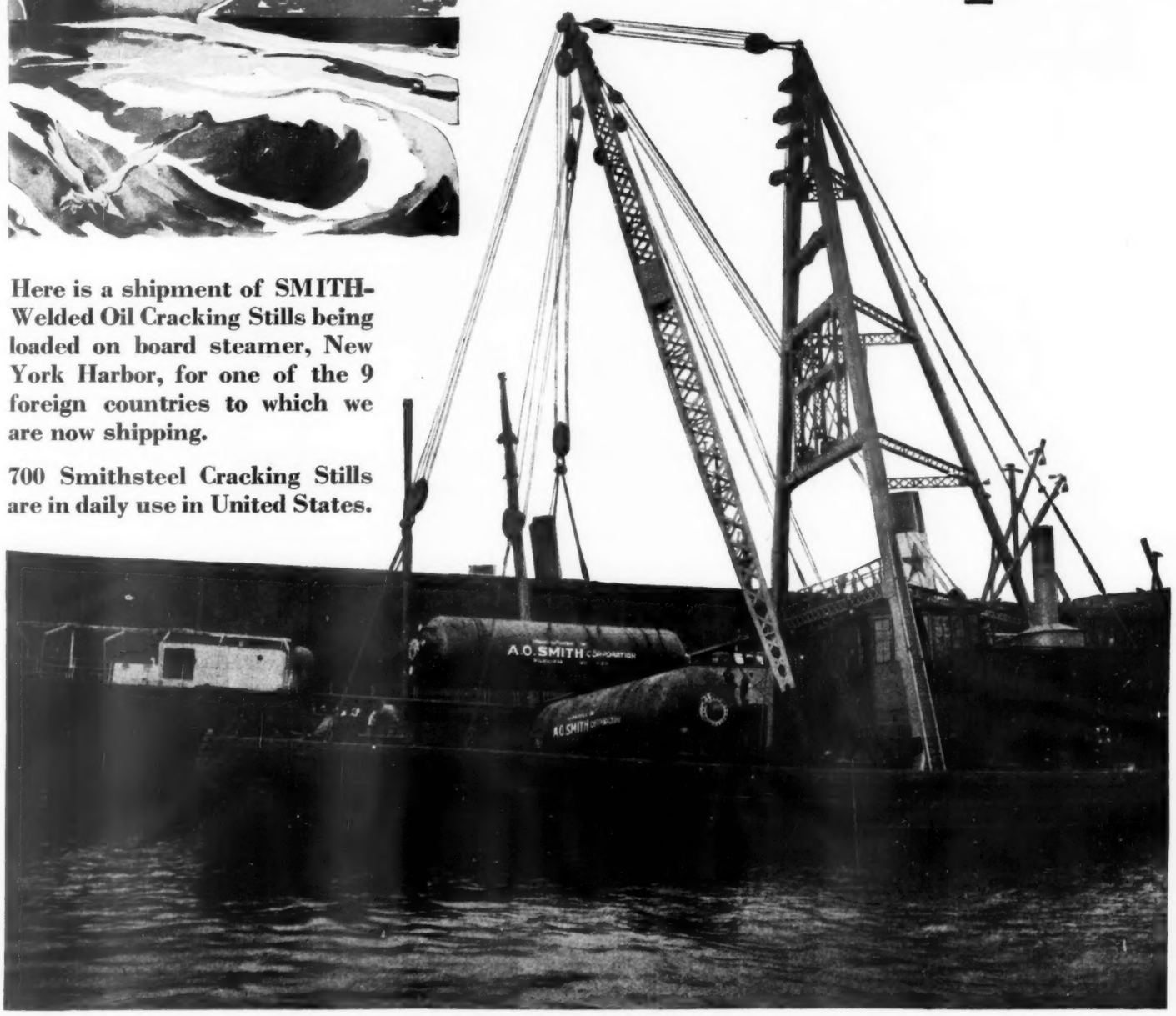
New York
Philadelphia
Pittsburgh
Columbus, O.
Minneapolis
Tulsa, Okla.
Charleston, W. Va.
Atlanta, Ga.
Beaumont, Tex.
Pensacola, Fla.



Why Import *when we* Export

Here is a shipment of SMITH-Welded Oil Cracking Stills being loaded on board steamer, New York Harbor, for one of the 9 foreign countries to which we are now shipping.

700 Smithsteel Cracking Stills are in daily use in United States.

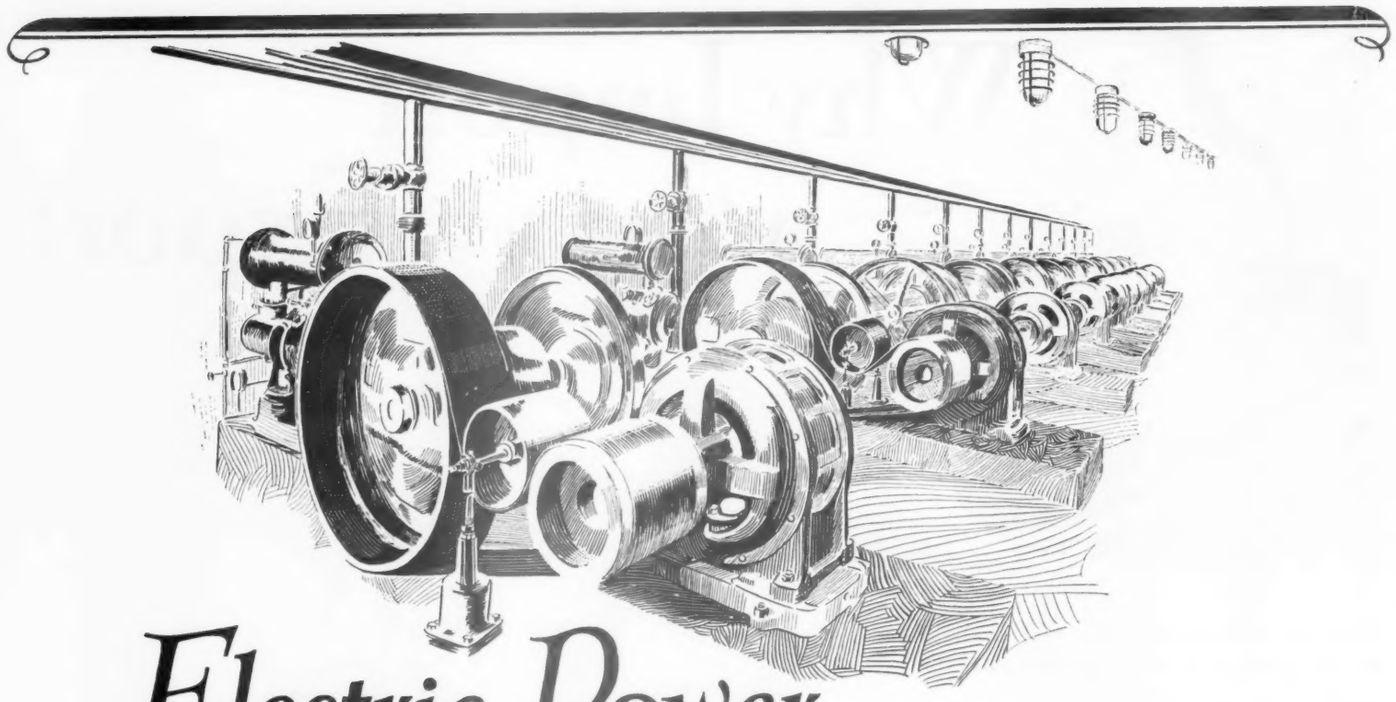


SMITH*WELDED*
CRACKING STILLS

A. O. SMITH CORPORATION, *General Offices: Milwaukee, Wis.*

OIL AND GAS FIELD PRODUCTS DIVISION

District Offices at New York City, Pittsburgh, Tulsa, Houston, Los Angeles



Electric Power

ELECTRICITY now holds a big place in the petroleum industry as an efficient power medium.

Our company supplied the industry 879,088 Kilowatt-Hours in 1920. This year, the total has grown to 243,774,778 Kilowatt-Hours and among the users today of ELECTRIC POWER are such companies as Carter, Magnolia, Empire, Tidal-Osage, Prairie, Texas, Oklahoma Pipe Line, Phillips Petroleum, Roxana Petroleum, Shaffer Oil & Refining, Sinclair Pipe Line, Cosden, Amerada, Gulf Pipe Line, T. B. Slick, Inc., and I. T. I. O. Surely, these big companies know what they are doing.

ELECTRIC POWER reduces operating costs—is quicker installed—initial investment and maintenance is less and production is increased due to continuous operation and uniform speed. Fixed charges are also reduced by motors taking the place of boilers, engines, gas, water piping and the lessened fire hazard reduces insurance expense.

For detailed information, address

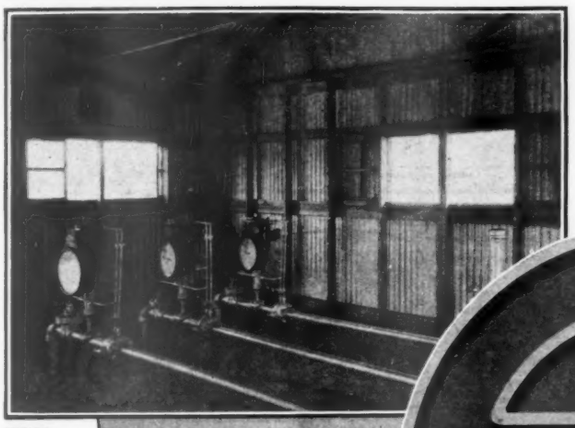
COMMERCIAL DEPARTMENT
OKLAHOMA GAS AND ELECTRIC COMPANY
OKLAHOMA CITY, OKLA.

OKLAHOMA GAS AND ELECTRIC COMPANY

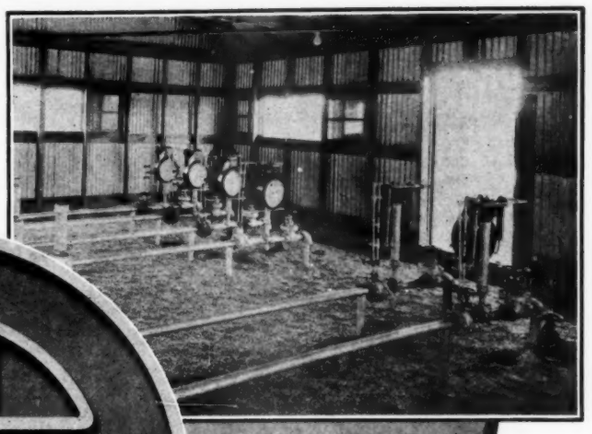
J. F. Owens, Vice President and General Manager

BYLLESBY — OKLAHOMA GAS AND ELECTRIC COMPANY — PIONEERS IN PUBLIC SERVICE

Courteous Personal Attention to Every Customer



Metric Orifice Meter Installations at Bowlegs, Okla.



Experience Leads to Recognition

"Our selection of this type of meter for our air and gas lift stations was due to our past experience in measuring gas under all ranges of pressure and vacuum. We have found them to be accurate and a very substantial instrument; therefore, they have been entirely satisfactory."

WESTCOTT & GREIS, Inc.
Sales Service
Dallas TULSA Los Angeles

METRIC METAL WORKS
of the American Meter Company, Inc.
• ERIE • PENNSYLVANIA • U·S·A •

METRIC orifice METERS

Put SURE in MeaSU·REment

Pick-up···*And How!*

Even on the frostiest mornings a motor fueled with Phillips '66' is full of pep—off ahead of the crowd.

Volatility*—controlled volatility—is the reason.

This user satisfaction means a steady increase in gallonage and profits wherever Phillips '66' is sold—brings customers back time and time again—makes them regular patrons and puts the service station business on a profitable basis.

Sell Phillips '66' for more and steadier profits the year round.

Write, wire, phone for quotations.

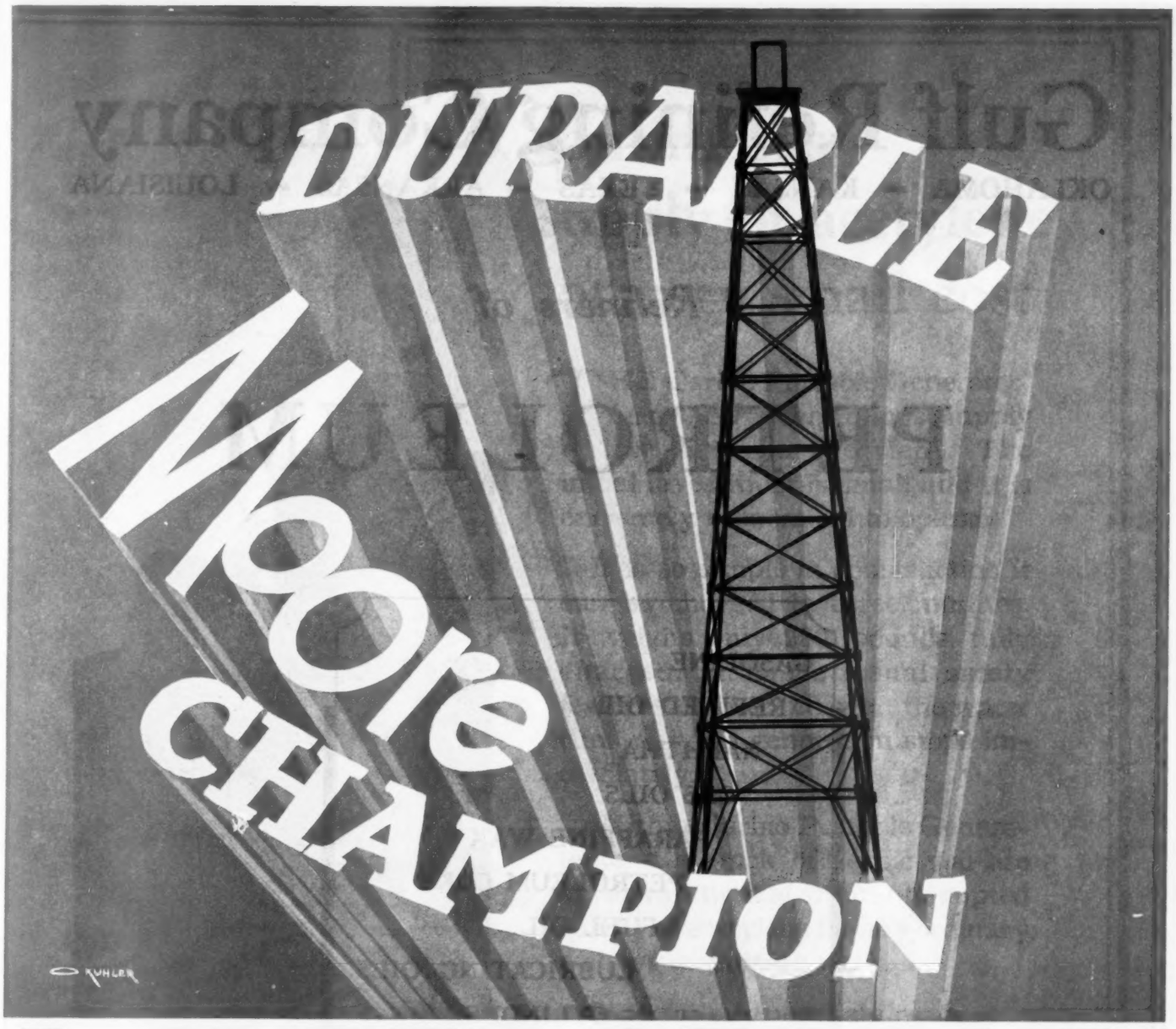
**Liquid gasoline must be vaporized before it can be burned in an engine. Volatility refers to the ability of a gasoline to vaporize.*

Phillips **PETROLEUM COMPANY**

BARTLESVILLE, OKLAHOMA

NATURAL GASOLINE FOR CONTROLLED VOLATILITY

Phillips 66



A SUPER DERRICK

LEE C. MOORE & COMPANY, *Inc.*

PITTSBURGH · TULSA

Established 1907

New York Offices: Oilfield Equipment Co., 30 Church St., New York, N. Y.

DALLAS, TEXAS HOUSTON, TEXAS WICHITA, KANSAS CASPER, WYO.
PARKERSBURG, W. VA. SHREVEPORT, LA.

Stocks in all Principal Fields

Gulf Refining Company

OKLAHOMA — KANSAS — TEXAS — ARKANSAS — LOUISIANA

Refiners of

PETROLEUM

GASOLINE
REFINED OIL
NAPHTHA
GAS OILS
PARAFFINE WAX
PETROLEUM COKE
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LUBRICATING OILS
CYLINDER
ENGINE
CORDAGE

Red and Pale Paraffine Oils

General Sales Offices: PITTSBURGH, PA.

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NEW YORK, HOUSTON, ATLANTA, BOSTON, NEW ORLEANS, PHILADELPHIA, LOUISVILLE

OCEAN TERMINALS

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Providence, R. I.
New York Harbor (Bayonne, N. J.)
Philadelphia (Girard Point, Pa.)
Charleston, S. C.
Savannah, Ga.
Jacksonville, Fla.
Port Tampa, Fla.
Mobile (Magazine Point, Ala.)
New Orleans (Gretna, La.)
Port Arthur, Texas
Galveston, Texas

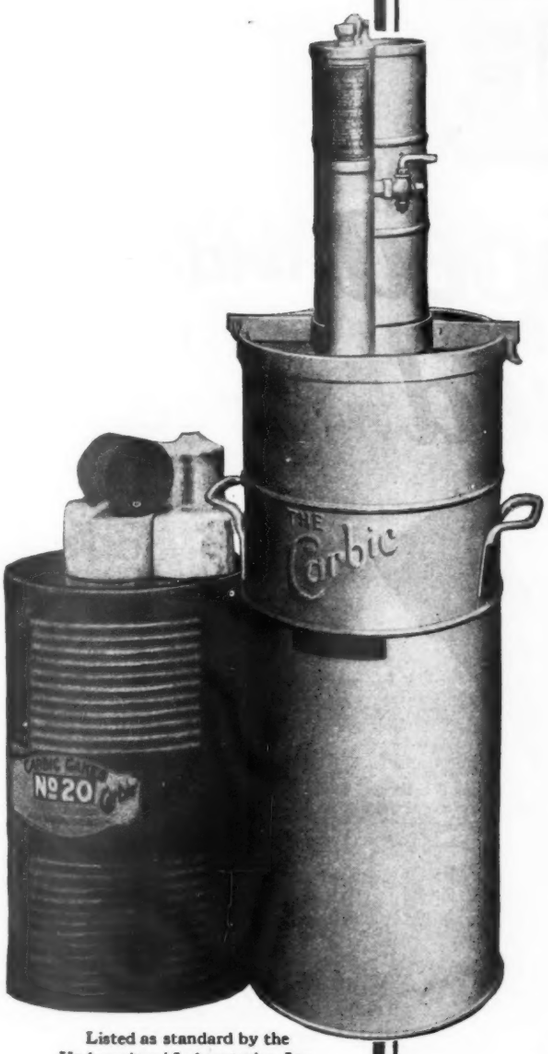
A continuous supply of acetylene at very small cost

THE Carbic Portable Generator* furnishes a continuous supply of low pressure acetylene. The initial investment is small and it is extremely economical to operate.

It is so simple in construction it can be charged in three minutes. It weighs only 200 pounds fully charged. It has unusual safety features. If knocked over, the water runs out and generation stops immediately.

With a Carbic Portable Generator and a stock of Carbic you are always assured of an uninterrupted supply of acetylene for any ordinary welding or cutting work.

Send for our new catalogue.



Listed as standard by the Underwriters' Laboratories, Inc.

OXWELD ACETYLENE COMPANY
Unit of Union Carbide and Carbon Corporation

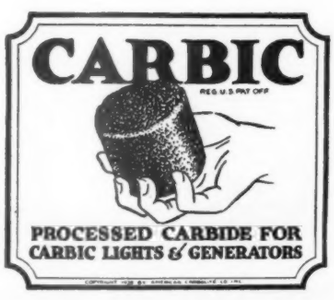
UCC

New York City, 30 East 42d St. Chicago, Peoples Gas Bldg.
San Francisco, Adam Grant Bldg.

CARBIC GENERATOR

For Oxy-Acetylene Welding and Cutting

*Anyone having a Carbic Generator is entitled to Oxweld Generator Service. Phone or write our nearest district office.



A standard drum of Carbic contains forty cakes, size No. 20. Carbic is distributed by the Union Carbide Sales Company through its national chain of warehouses.

THE LAYNE

Wire Wrapped and Mill Grooved Screen

The new Milled Groove of the Layne and Bowler Screen has proven to the complete satisfaction of many hundreds of users that increased production is possible in the same old well.

A much larger inflow area, but the same unusual strength has been the secret of the increasing popularity of the new type screen.

ASK THE COMPANY THAT HAS USED IT.

Write, phone or wire for any information on this new type screen.

The Layne & Bowler Co.

Houston, Texas

THE LAYNE-NEW YORK CO.
30 Church St., New York

The LAYNE & BOWLER CORP..
Los Angeles, Calif.

VICKERS, LIMITED
London, England

Fishing Tools Drilling Tools

AMERICAN IRON & MACHINE WORKS, INC. · OKLAHOMA CITY ·

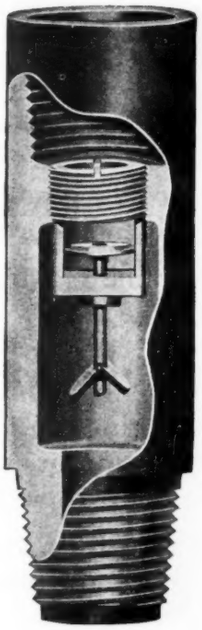
FOUR POINTS OF SUPERIORITY— In the American Float Valve

1. Easy By-Pass of Fluid.

2. Less Slush Wear on Seat and Valve.

3. Easy Milling Out.

4. Typical American Endurance.



Notice the large aperture in the cage of the valve assembly. This means easy by-pass of fluid because it reduces back pressure on the hose, piston rubbers and liner packing—hence less steam is needed in getting the fluid to the contact points.

Notice that the valve drops far enough to reduce travel wear of slush to a minimum.

Examine the points of construction that tend toward easier milling out when you have a line of drill pipe stuck—the valve being made to dimensions to pass through tool joints to top of lubricator or bit—when you run the American Inside Drill Pipe Cutter.

Remember that it's a typical American tool . . . strong, sturdy, dependable . . . Some of these floats have the original valve assembly in use after months of service under high pressure gas and sandy lime formations.

Look over the American tools listed below. They are carried by your best supply company. If you want detailed information on any tool in this list write to us and we shall be glad to send you a descriptive folder on that tool.

AMERICAN IRON AND MACHINE WORKS, Inc.

Manufacturers of Oil Field Equipment

Oklahoma City, U. S. A.

AMERICAN OIL FIELD EQUIPMENT

American Releasing and Circulating Overshots
American Rock Bit Wrenches
American Milling Shoes
American Flexible Coupling for Rock Bit Lubricators
American Steel Tool Houses
American Forged Steel Wall Hooks
American Rock Bit Breakout Blocks
American Paraffin Bits
American Female Die Nipples
American Tapered Taps
American Forged Steel Subs
American Rotary Shoes
American Cone Fishing Baskets
American Steam Lubricators
American Side Tracking Mills
American Combination Reverse and Throttle Levers
American Rock Bit Lubricator Wash Pipe Attachments
American Rotary Milling Tools
American Myracle Sucker Rod Sockets
American Surface Bit Blades for Rock Bits
American Drill Pipe Float Joints
American Pump Manifold Check Valves
American Casing Suspension and Blowout Preventer
American Lead Plug
American Rock Bit Cone Fishing Sockets

The Sign of a Good Gasoline

MAGNOLIA ANTI-KNOCK GASOLINE

Backed by Magnolia Standards

BEFORE Magnolia Anti-Knock Gasoline was put on the market, careful research, exhaustive tests and proved results were necessary to insure that our new gasoline was up to the high standards maintained in all of Magnolia products.

Magnolia Anti-Knock Gasoline is offered to the public and to the trade with the reputation of the Magnolia Petroleum Company solidly behind it.

It is a pure petroleum motor fuel which gives quiet and steady tugging power without over-heating on the long, heavy pulls; a fuel for high and medium compression motors which eliminates fuel knocks without penalties for the repair of pistons, valves or gas lines.

The same usual high quality will be maintained on Magnolia Gasoline. Magnolia Motor Oils and Lubricants defeat wear on all moving parts of automotive equipment.

All Magnolia Products are Obtainable at Magnolia Stations & Dealers

Magnolia Fuel Oil Loading Stations at Beaumont, Corsicana, Sabine, Galveston, Fort Worth, Harbor Island, Luling, Corpus Christi, Dallas, Herma, Arkansas; Mirando.

Refineries located at Beaumont, Corsicana, Fort Worth.

Division Sales Offices at Dallas, Houston, Fort Worth, San Antonio, Oklahoma City, Little Rock, Amarillo, El Paso.

Inquiries Respectfully Solicited

Magnolia Petroleum Company

General Offices: DALLAS, TEXAS

The petroleum industry has made commendable progress in the direction of efficiency and conservation. Yet—as long as "B. S." and "tank bottoms" are thrown away —*needless waste* is being allowed, for TRET-O-LITE can be used profitably to recover every drop of petroleum from crude petroleum emulsions.

Tret-O-lite

Reg. U. S. Pat. Off.

W. S. BARNICKEL & CO.
Webster Groves, Mo.

Unsurpassed
STEEL TUBULAR PRODUCTS

STANDARD SEAMLESS

CASING

TUBING

DRILL PIPE

LINE PIPE

STILL TUBES

Sizes 2 inch to 13⅜ inch O. D.

ETNA WELDED

STANDARD PIPE

CASING

TUBING

LARGE O. D. PIPE

LINE PIPE

DRIVE PIPE

DRILL PIPE

Sizes ⅛ inch to 24 inch O. D.

SPANG, CHALFANT & CO., INC.

GENERAL OFFICES, CLARK BUILDING

PITTSBURGH, PA.

Sales Offices: CHICAGO, ILL. - NEW YORK, N. Y. - ST. LOUIS, MO.
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Mills: ETNA, PENNA. - SHARPSBURG, PENNA. - AMBRIDGE, PENNA.

COLLECTED
CONDENSED
CONVEYED
A special product "Naturaline" made entirely from Natural Gasoline has proven to be a wonderful Aviation fuel now enjoying widespread distribution.
Undoubtedly other valuable products of Natural Gasoline will soon be discovered and released to the service of mankind.
Chestnut & Smith Corporation have long been committed to the study, research and development of Natural Gasoline.
Natural Gasoline and Chestnut & Smith Corporation are synonymous. For fifteen years the refining industry has depended upon the product and the service of this institution.
No detail has been too trivial for special attention, no order reposed with confidence that has not been respected as a sacred obligation. A single car or a trainload receive equal consideration.
Our business is the production of Natural Gasoline—collected, condensed, conveyed to you—and our avowed purpose is to give the best service possible.
CHESTNUT & SMITH
CORPORATION
CHESTNUT & SMITH BUILDING
Tulsa, Oklahoma

American Hammered Piston Rings

Individually cast, mechanically hammered to give lasting tension, particularly designed and adapted for Oil Field and other severe service.

Endorsed and used as Factory Equipment by---

Ajax Iron Works	Corry, Pa.
Bruce-Macbeth Eng. Co.	Cleveland, Ohio
Bovaird & Seyfang Mfg. Co.	Bradford, Pa.
Bradford Supply Co.	Bradford, Pa.
C. & G. Cooper Co.	Mount Vernon, Ohio
Chicago Pneumatic Tool Co.	New York, N. Y.
Clark Bros.	Olean, N. Y.
Franklin Valveless Eng. Co.	Franklin, Pa.
Ingersoll-Rand Co.	New York, N. Y.
McIntosh & Seymour Corp.	Auburn, N. Y.
Muncie Oil Engine Co.	Muncie, Ind.
National Supply Co.	Toledo, Ohio
Pennsylvania Pump & Compressor Co.	Easton, Pa.
Power Mfg. Co.	Marion, Ohio
Jos. Reid Gas Eng. Co.	Oil City, Pa.
Titusville Iron Works	Titusville, Pa.
Worthington Pump & Mach. Corp.	New York, N. Y.

Look for the BALL POINT HAMMER MARKS *inside the ring*

May be obtained from the above companies, or their selling agents, in standard sizes or oversizes.

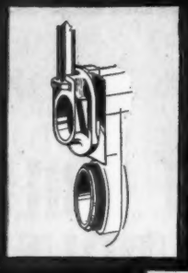
Rings for any engine or compressor not listed above can be obtained direct from us.

The American Hammered Piston Ring Co. Baltimore, Md.

Always Clean—Efficient

SCALE AND SEDIMENT SLICED OFF DISCS AND SEATS EVERY TIME

OPERATED—AS ONE HAND WASHES THE OTHER

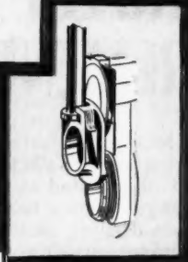


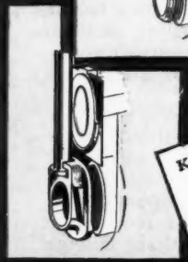
Accumulated scale and sediment cause most valve leaks and misalignment. A clean valve is leak-proof.

KELLY NEWAYS eliminate these troubles. While open, the discs are fully protected by their metal-to-metal contact with protector plates. *No scale or sediment can accumulate.* As the valve is closed, the discs automatically clean and polish the seats—as one hand washes the other.

Again there is a positive, clean, metal-to-metal contact. Kellys are *always clean—always tight—efficient.*

This is but one of *nine* such important exclusive Kelly advantages. Let us tell you them all. Return the coupon.





KELLY CO.
370 W. Grand Ave., Chicago, Ill.
Gentlemen—Please send me full information on your Kelly Neway Valves.

Name _____

Firm _____

Street Address _____ State _____

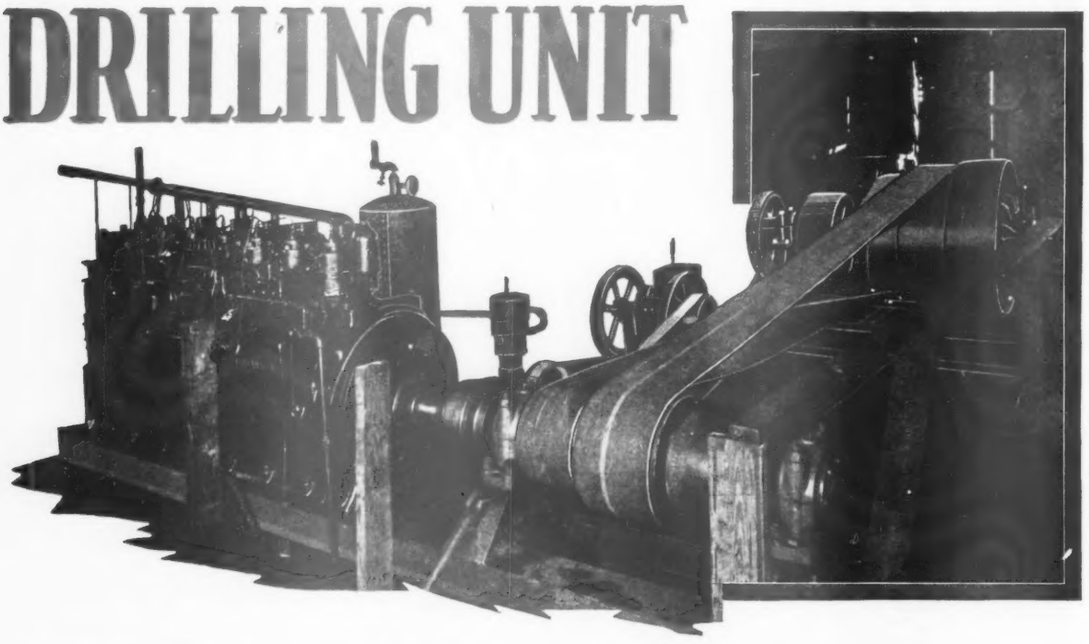
City _____

Kelly Co.

VALVES

ALSO MANUFACTURERS OF KELLY SELF-GRINDING GLOBE AND ANGLE VALVES

F-M PORTABLE Cable Tool DIESEL DRILLING UNIT



GIVES PERFECT DRILLING MOTION *Plus* TREMENDOUS SAVINGS!

The FAIRBANKS-MORSE Portable Diesel Drilling Engine with Selective Drilling Motion Control is hailed as the internal combustion engine which has at last achieved a perfect drilling motion, and which revolutionizes drilling expense by operating on crude oil at surprisingly low cost.

A special governor enables the operator to vary the constant speed between 800 and 250 R.P.M. Also, a Selective Motion Control Dial enables the operator instantly to vary the *type* of motion, to suit drilling conditions, without change of flywheel weights. During every revolution of the band wheel the speed of the engine can be varied through a considerable range, although the average speed remains constant as set by the governor control wheel.

The F-M Diesel Drilling Unit, in 4 and 6 cylinder sizes, offers ample power for all drilling operations. Engine is direct connected to a 2-speed Drilling Countershaft, gearless, reversible, with air-cooled disc clutches, Timken Tapered Roller Bearings and independent neutral brake. Weight per horsepower is low and engine and auxiliary units are mounted on skids for ready portability.

"If CONTINENTAL Sells It, There Is No Better"

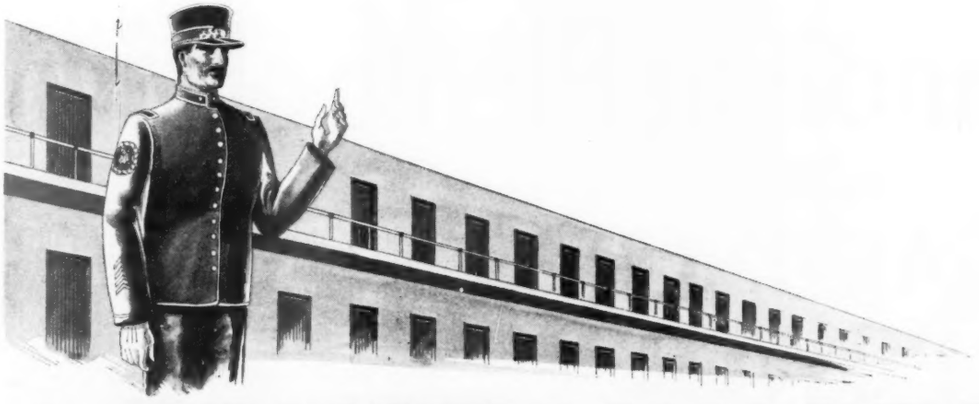
THE CONTINENTAL SUPPLY COMPANY

General Offices: St. Louis

Export Office: 74 Trinity Court, New York
London Office: 316-317 Dashwood House, Old Broad St., E. C. 2

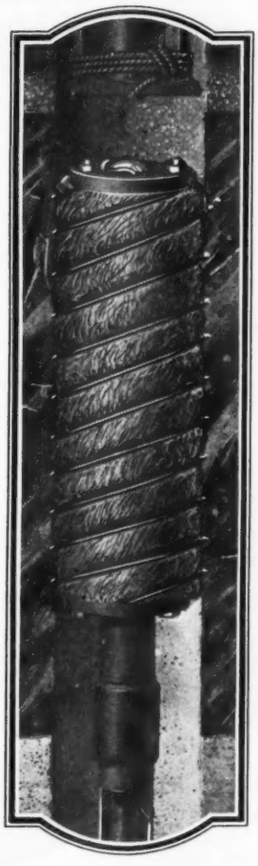
THE CONTINENTAL SUPPLY CO., Ltd.
411 Lancaster Bldg., Calgary, Alberta, Canada

CONTINENTAL



A TRUSTY WARDEN

for keeping all BOTTOM WATER *tightly imprisoned*



When bottom water threatens your well, the Guiberson Spiral Bottom Water Plug will give you complete protection and peace of mind by plugging it off thoroughly and permanently. When the Plug is collapsed into position, its steel spirals dig into the walls of the well and take a tremendous hold. Gas pressure accomplishes nothing against it. Oakum packing between the spirals becomes a non-porous mass which prevents the slightest amount of water passing. This oakum will outlast the well.

THE GUIBERSON SPIRAL BOTTOM WATER PLUG

holds its place with a screw-like grip

Once set, the Spiral Bottom Water Plug may be forgotten—or remembered with a feeling of perfect security. Furnished in Standard Type, in Wash-Down Type permitting flushing of hole before setting, and in Collapsible Core Type for setting close against bottom. Also Spiral Tubing and Casing Packers. Fully patented.

"Better Be Safe Than Sorry"

THE GUIBERSON CORPORATION

Box 1106, Dallas, Texas

California Branch: 1506 Santa Fe Ave., Los Angeles

402 W. First St., TULSA | 321 Osage St., PONCA CITY | 506 Trust Bldg., NEWARK, O.

GUIBERSON

BETTER BE SAFE THAN SORRY

Handling Plenty of Mud

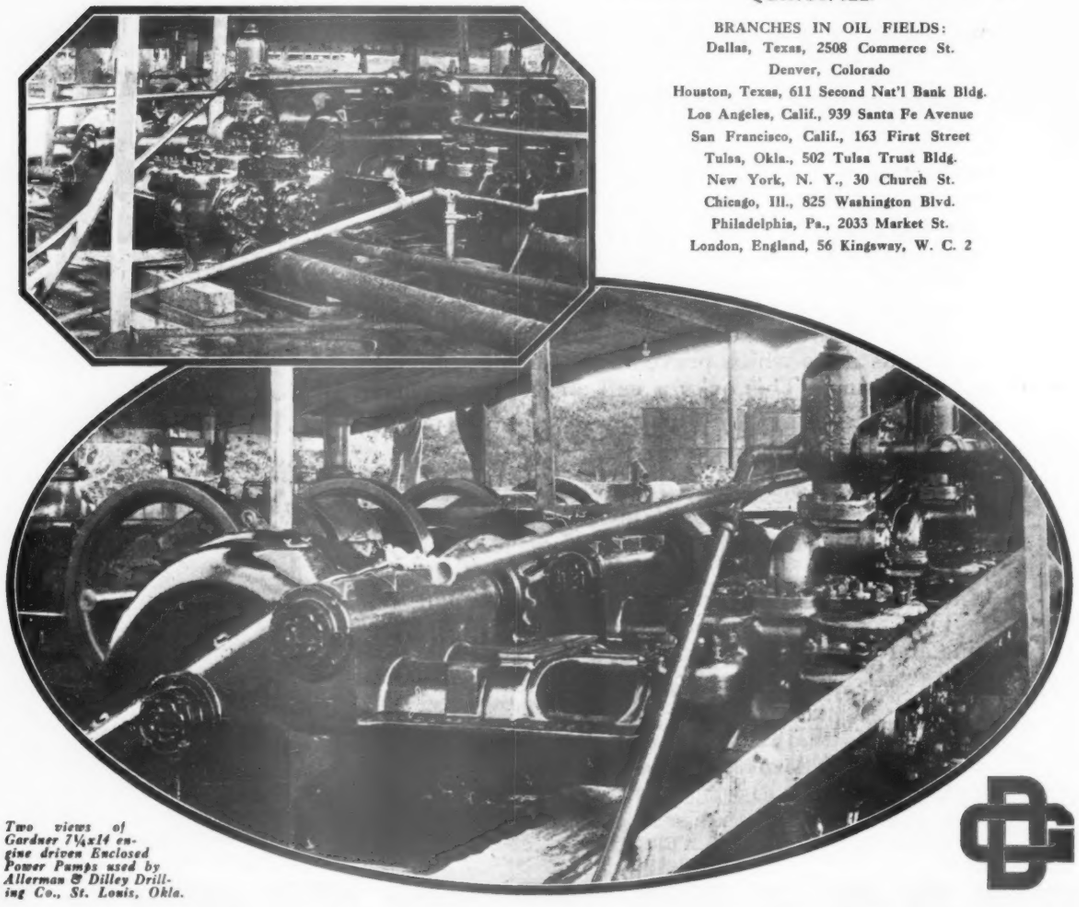
with GARDNER POWER PUMPS

Gardner 7¼x14 Enclosed Power Pumps are fast growing in favor for deep rotary drilling because they handle plenty of mud at the necessary high pressures and operate at minimum cost for power and maintenance.

Gardner Mud Pumps are available in a full range of sizes, in engine, motor and steam driven types. Bulletins on request.

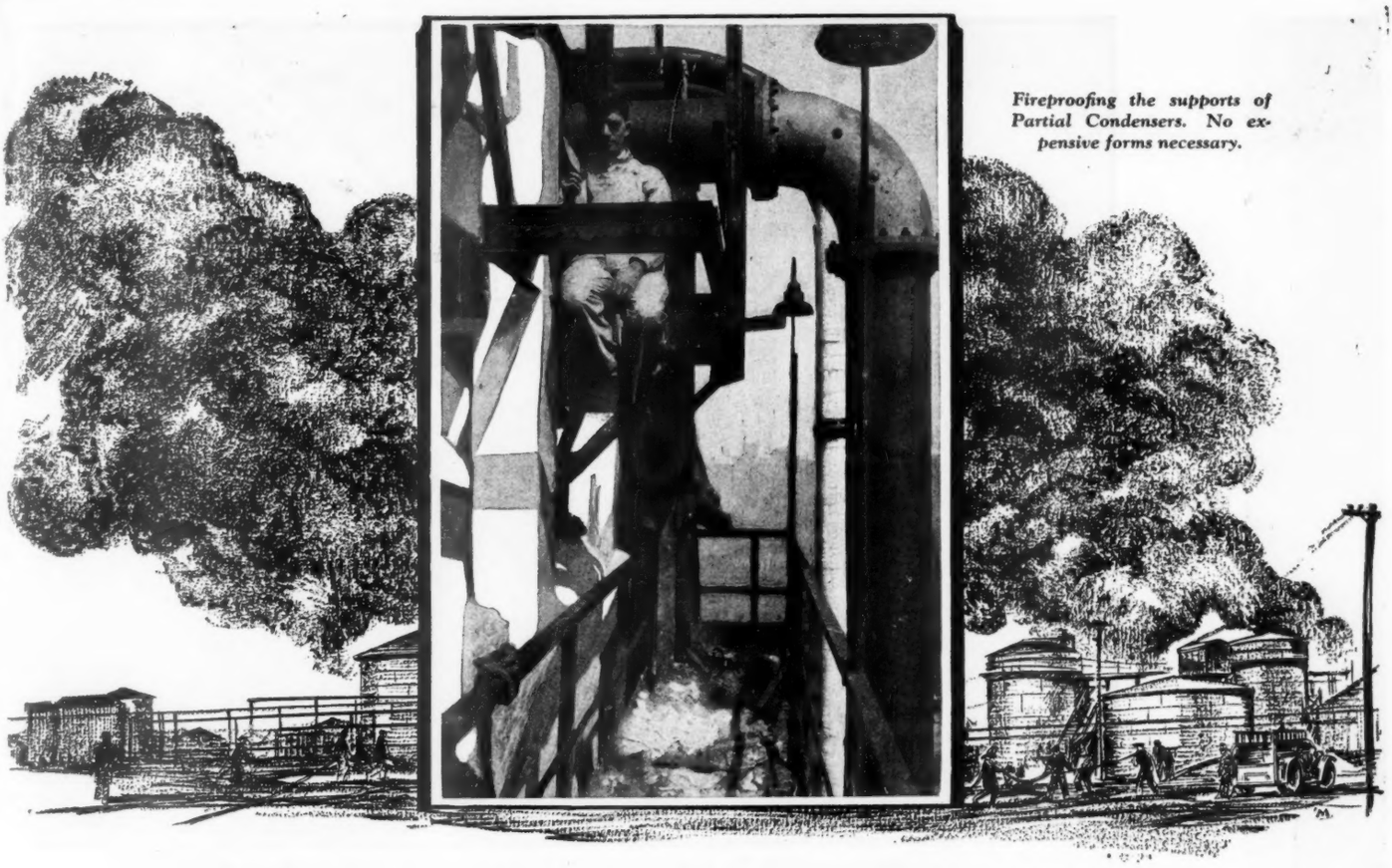
GARDNER-DENVER COMPANY
QUINCY, ILL.

BRANCHES IN OIL FIELDS:
Dallas, Texas, 2508 Commerce St.
Denver, Colorado
Houston, Texas, 611 Second Nat'l Bank Bldg.
Los Angeles, Calif., 939 Santa Fe Avenue
San Francisco, Calif., 163 First Street
Tulsa, Okla., 502 Tulsa Trust Bldg.
New York, N. Y., 30 Church St.
Chicago, Ill., 825 Washington Blvd.
Philadelphia, Pa., 2033 Market St.
London, England, 56 Kingsway, W. C. 2



Two views of Gardner 7¼x14 engine driven Enclosed Power Pumps used by Allerman & Dilley Drilling Co., St. Louis, Okla.

GARDNER-DENVER



Fireproofing the supports of Partial Condensers. No expensive forms necessary.

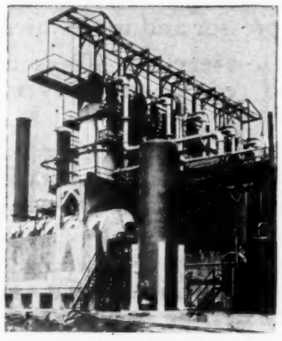
Fireproofed by Johns-Manville

Steel Towers and Supports are Protected Against the Hottest Oil Fire

DURING recent oil fires the collapse of costly overhead equipment due to the failure of the structural steel towers and steel supports has emphasized the necessity and the importance of adequately fireproofing such steel work.

Johns-Manville, as pioneers of fireproofing, offer insulating materials for structural steel best designed to meet oil fire conditions. Years of experience and close contact with the oil industry and its needs have enabled us to perfect them. They can be installed without the expensive forms necessary for concrete, and have a far higher insulating value than either concrete or brick, thus giving superior protection to the steel.

The efficiency of Johns-Manville fireproofing has been demonstrated not only in exhaustive laboratory tests, but its value has been repeatedly proved in serious oil fires. An excellent example was a recent fire in the Hercules Refining Company's refinery in the Vernon District which threatened the entire plant, and the surrounding section of Los Angeles as well. All of the equipment fireproofed by Johns-Manville went through this fire under the most severe conditions without a single failure.



Supporting legs of tank in foreground, knee braces and girders of tower supports and supporting members of Partial Condensers above towers fireproofed by Johns-Manville.

In addition to structural steel protection, Johns-Manville fireproofing has been successfully applied to the protection of remote control rods, by which valves can be operated at a distance in case of fire. With Johns-Manville fireproofing, remote control is a dependable actuality—there is no danger of failure at the critical time, no possibility of the rods being rendered useless through exposure to fire.

MASTER *of* ASBESTOS

Johns-Manville

STRUCTURAL STEEL PROTECTION

JOHNS-MANVILLE CORPORATION
Oil Industry Department
New York Chicago Cleveland San Francisco
Branches in all large cities
Canadian Johns-Manville Co., Ltd., Toronto
(*Mail this coupon to branch nearest you*)
We are interested in receiving further information regarding fireproofing of structural steel.

Name.....

Address.....

City.....State..... SSP-44-6

The Carter Oil Company's Grisso No. 1 Air Plant, operating 12—165 H. P. Bessemer Type Ten Compressors equipped with 13½"x6¼"x20" Bessemer V. H. Cylinders

Why do Bessemers dominate in Compressor service?

BECAUSE of their unfailing high running time—Bessemers invariably deliver 99%+ running time.

Because they are specifically engineered for Oil Industry compressor service—Bessemers are unsurpassed in both compressor and mechanical efficiency.

Because they require less servicing—Bessemers literally run themselves, and require the very minimum of parts adjustment or replacement.

Because their economy is something tangible—for years Bessemers have been demonstrating in thousands of installations that their operating cost per hour of service is appreciably lower.

Because Bessemers have every sound, advanced feature known to engineering science—and are built with strength plus to deliver service plus.

These are just a partial list of the reasons why more compressor plants are powered with Bessemers than any other make.

BESSEMER ENGINE COMPANY
52 York Street :: Grove City, Pa.

BESSEMER

Improved Split Casing Ring

PATENTED

For

Emergency and Permanent Suspension.

The Hinderliter Improved Split Casing Ring can be placed around the casing or pipe in the process of lowering, pulling or suspending in the same manner as ordinary casing clamps without the assistance of bolts and nuts with the increased factor of safety.

The lug construction of the Hinderliter Improved Type Split Casing Ring affords easy handling when used in connection with casing outfit and casing Elevator Link.

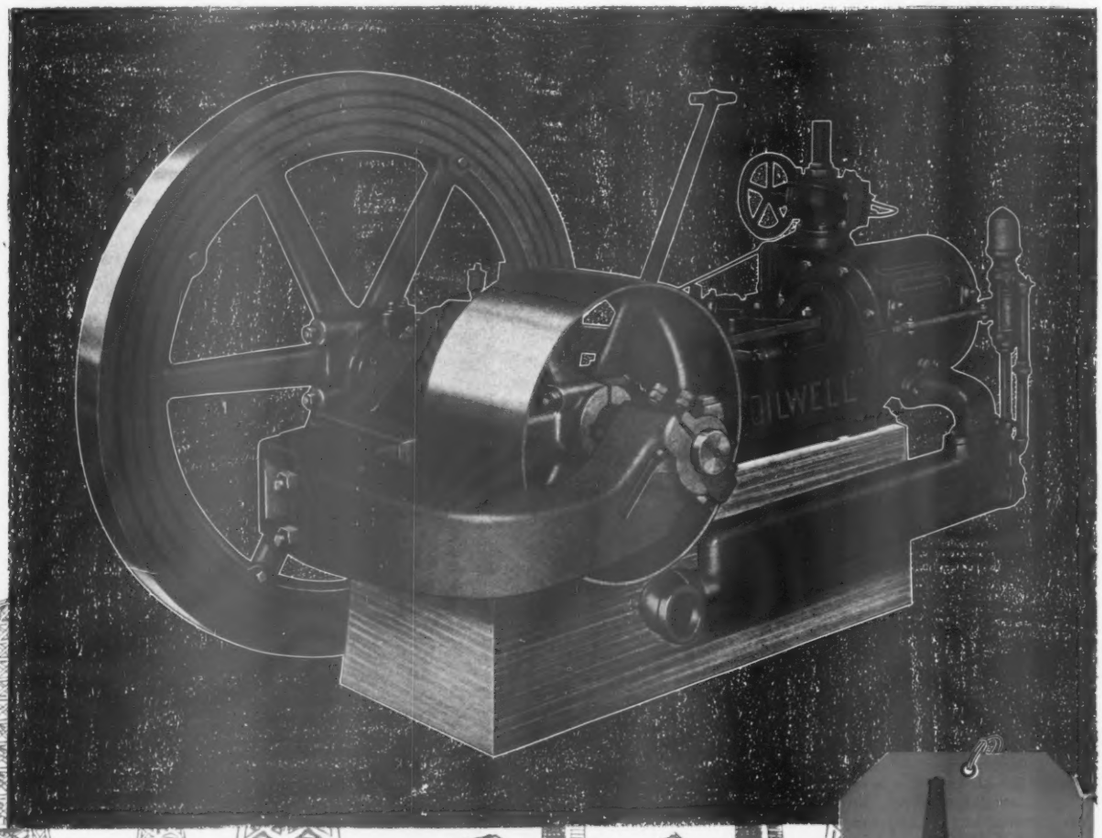
Can be installed and dismantled by two men.

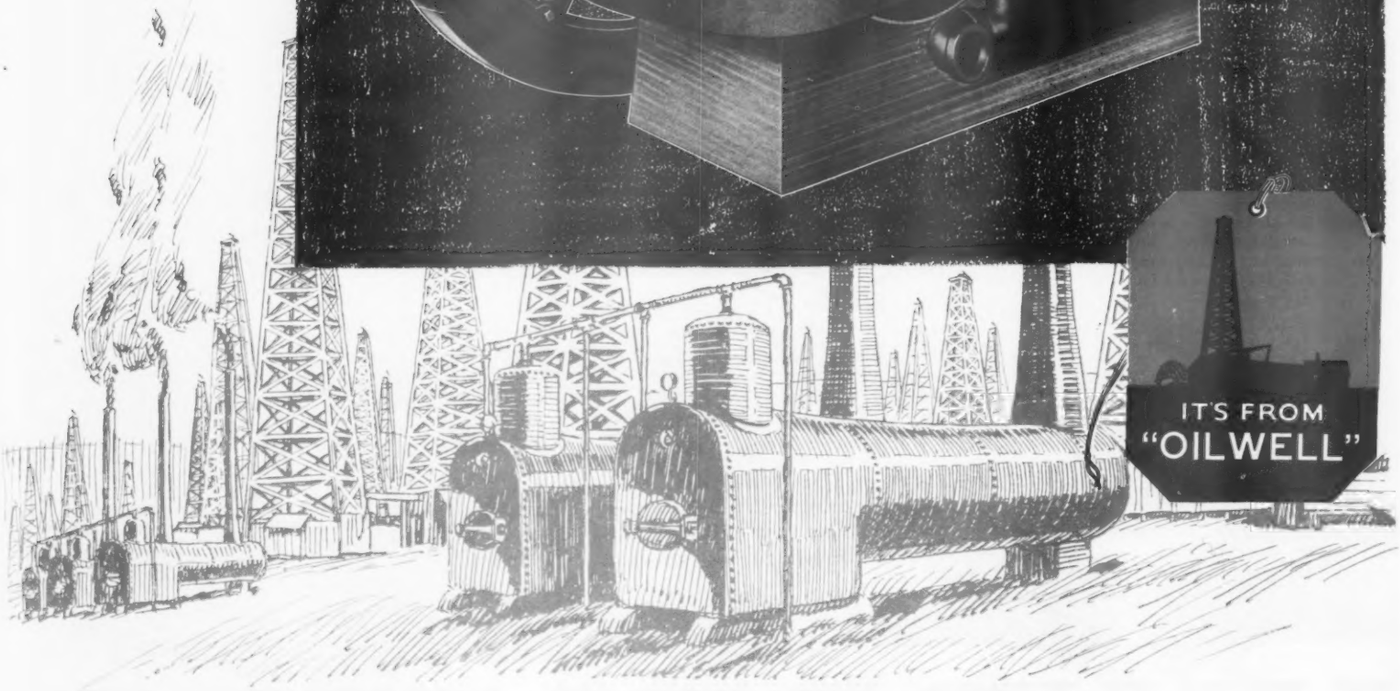
HINDERLITER

HONEST TOOLS

ROTARY STANDARD CABLE

Built to do the Hard Jobs





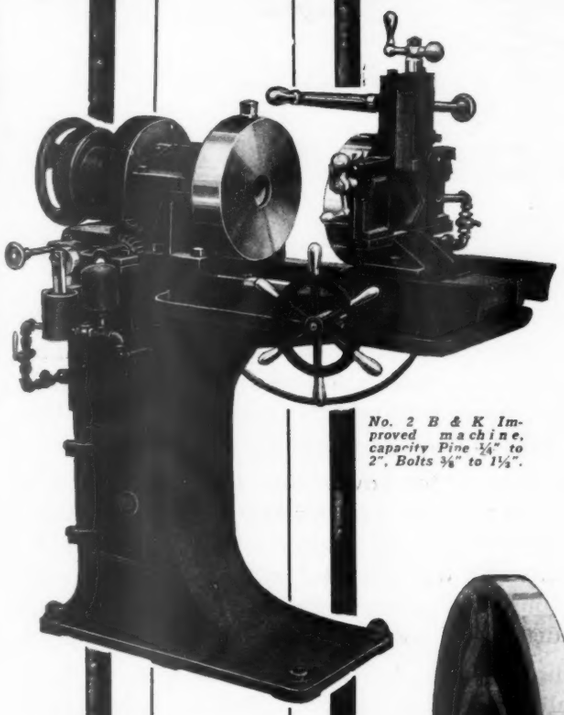
OIL WELL S

WORLD'S OLDEST AND LARGEST
MANUFACTURERS OF OIL FIELD EQUIPMENT

PITTS

PEERLESS B&K DUPLEX P.D.O.C

B&K Machines are the A to Z in thread cutting



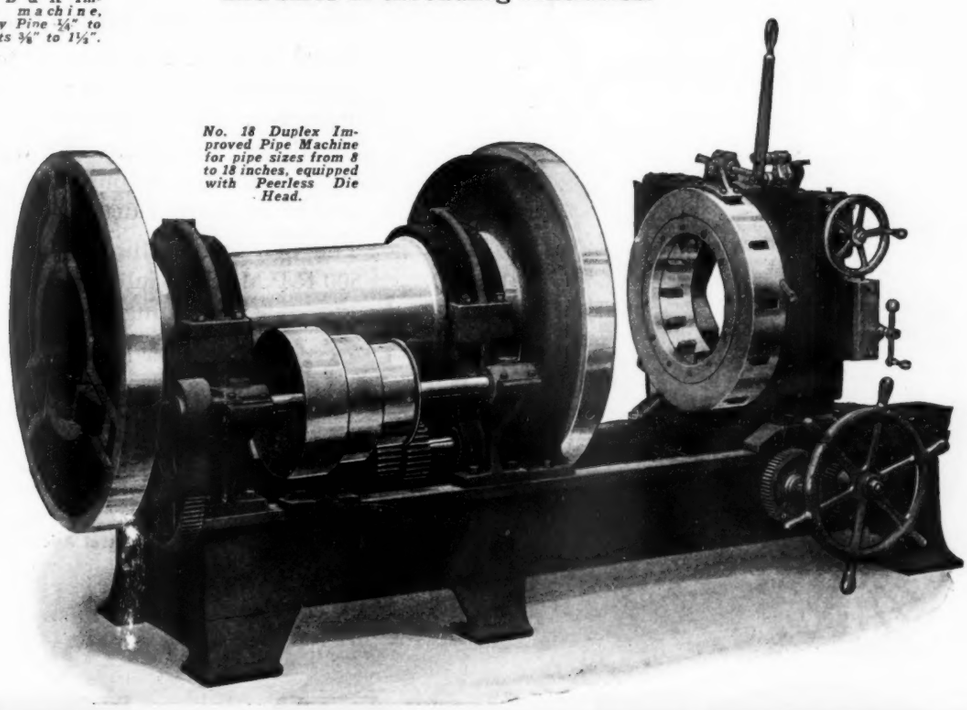
No. 2 B & K Improved machine, capacity Pine ¼" to 2", Bolts ⅜" to 1½".

WHETHER you are threading a quarter-inch or twenty-inch pipe, you can do it better, quicker, and cheaper with B & K machines. They have survived fifty years of the grueling service—in the oil fields. They are easy to operate and turn out precision work indefinitely. B & K machines are practically new after twenty years of service.

B & K is in the oil man's vocabulary who speaks in terms of the best.

Send for our complete catalog of the 17 types and sizes of threading machines.

No. 18 Duplex Improved Pipe Machine for pipe sizes from 8 to 18 inches, equipped with Peerless Die Head.



Bignall & Keeler Machine Works

of the N. O. Nelson Manufacturing Co.

Edwardsville, Illinois

O&GJ 11-29 Gray

THESE SAVINGS ARE no Secret

Operators throughout the Mid-Continent—hundreds of drilling cost records—speak of the savings effected with the CLARK Drilling Engine. It is no secret that this engine reduces drilling time, fuel cost and upkeep expense to a minimum.

There is never any waiting for power with the CLARK—it is always ready to deliver maximum power at maximum speed indefinitely. Fuel costs are low—24 hours on 7,000 feet of gas or 75 gallons of gasoline. No water is used except for cooling—no scale cleaning—no long water pipes to freeze. Long life is guaranteed by correct design, rugged construction and slow speed.

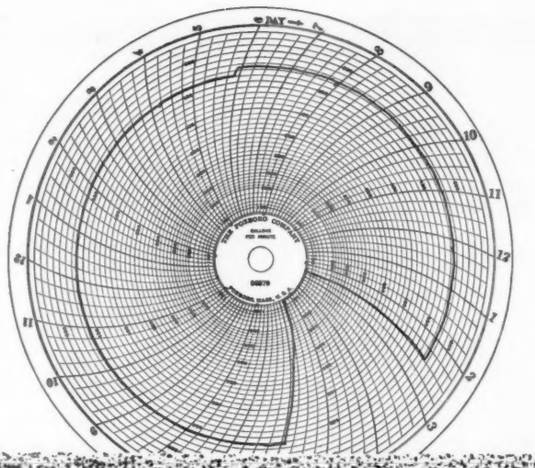
The CLARK Drilling Engine delivers 35 to 120 H.P. at 85 to 500 R.P.M. Has full derrick floor control. Engine, with 2-speed drilling countershaft, is easily portable on its own truck, and quickly installed on mud sills.

CLARK BROS. COMPANY
Olean, N. Y.

Branches and Warehouses: 125 W. First St., Tulsa; McCamey and Sweetwater, Texas; and Artesia, N. M.

SMITH, BOOTH, USHER COMPANY
228 S. Central Ave., Los Angeles, and 50 Fremont St., San Francisco

CLARK



This chart of oil control on a gasoline sweetening plant shows the.. absolute.. uniformity.. of Foxboro Flow Control. This is due to the full floating Valve Action of the Foxboro Rate of Flow Controller.

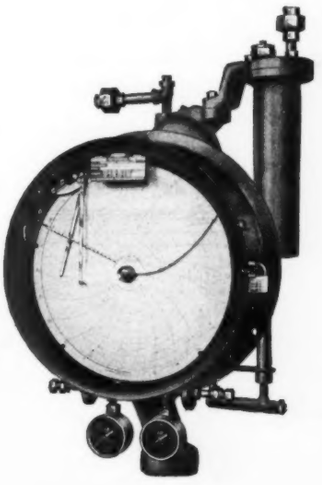
Think what a tremendous advantage it would be to control the rate of flow in your plant!

The Foxboro Automatic Rate of Flow Controller is a Controlling Orifice Meter. It combines the accuracy of the Foxboro Orifice Meter with the dependability of Foxboro Air-Actuated Control.

Set the Controller at the rate of flow you want. The controlled valve maintains that rate of flow either by controlling the speed of the pump or by controlling a valve in the flow line. It is not a pressure controller. It is entirely independent of line pressure. The Foxboro Rate of Flow Controller records as it controls, accurately and instantaneously. You know at any time exactly how much fluid is passing through the pipes.

Foxboro Rate of Flow Controllers are being used throughout the oil industry to control the rate of flow of hot or cold oil, gasoline, sulphuric acid, doctor solution, caustic or any other fluid. In refineries, for example, they are installed on pipe stills, cracking units, shell stills, fractionating towers, bubble towers, lubricating oil treating and blending processes, acid treatment processes and gasoline sweeteners.

Each instrument is fully covered by the Foxboro sealed guarantee.



The Foxboro Rate of Flow Controller.

Write for further details.

The Foxboro Company

Neponset Avenue, Foxboro, Mass., U. S. A.
205 So. Cheyenne Ave., Tulsa, Okla.
Magnolia Bldg., Dallas, Texas
J. E. TREACY, Strada Golesti No. 9, Ploesti, Roumania

New York	Chicago	Cleveland	Portland, Ore.
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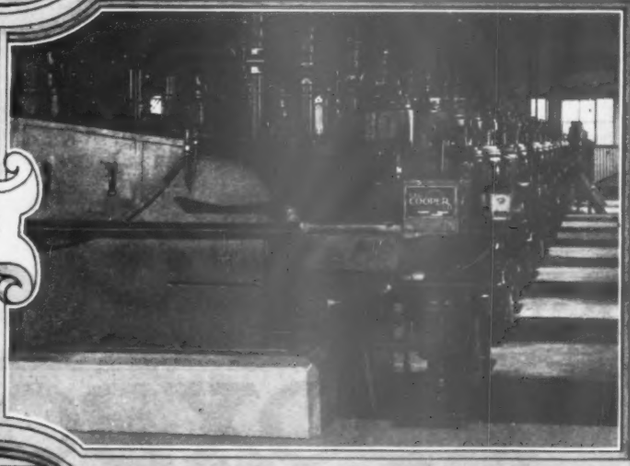
FOXBORO
Reg. U. S. Pat. Off.
THE COMPASS OF INDUSTRY

Instruments for Controlling, Recording and Indicating Temperature, Flow, Humidity and Pressure

Houston Pipe Line Company's Refugio Texas compressor station, pictured below, contains nine Cooper 170 horse power gas engines driving compressors.



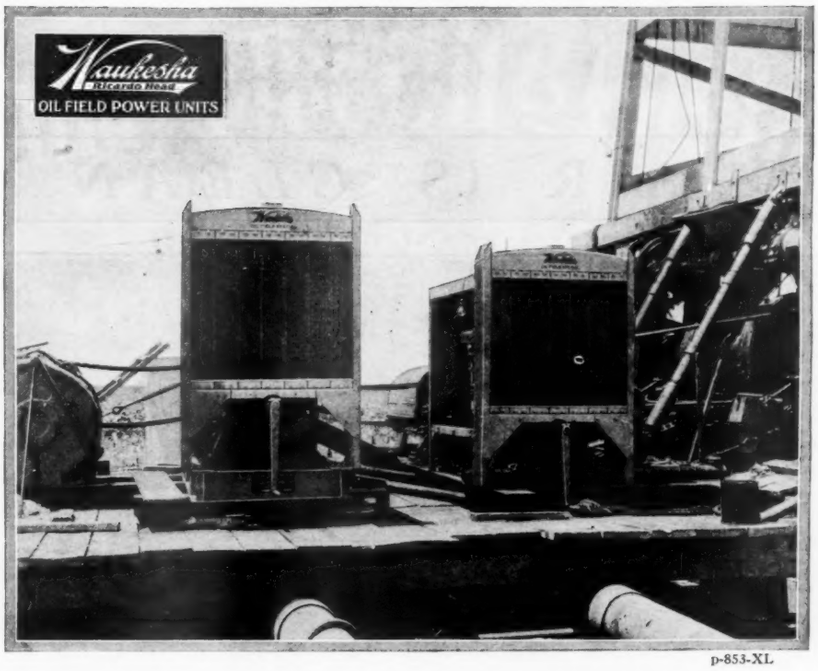
A 7000 Horse Pow

Coope

Houston Pipe Line Company's Edna Te Compressor Station, pictured above, w originally built with six one thousand ho power Cooper gas engine driven c pressors. A seventh unit has since b added. The auxiliary power is furnish by two Cooper 190 horse power t

The C. & G. Coop

1111 Magnolia Bldg., Dallas
49 South



p-853-XL

Two Waukesha Huskies at Blue Ridge, Texas

They Pack A Punch

Ask any man who has used Waukesha Oil Field Power Units and he will tell you they deliver a knock-out punch to production or drilling costs. They are not only low in first cost but in operation, and the scarcer water the more necessary they are.

When it's power you want you cannot beat a Waukesha Oil Field Power Unit. They are built in two types—the Portable Housed Unit and the Stationary Indoor one. Power range from 20 to 120 H. P. with convenient steps to meet every oil field power requirement. Remember they run equally well on waste gas or gasoline.

"L-Head Engines—They take better care of themselves."

P-867-XL

OIL INDUSTRY EQUIPMENT DIVISION

WAUKESHA MOTOR COMPANY

Waukesha Wisconsin

New York — 8 W. 40th St.
Tulsa — C. F. Camp Co.
Houston — Portable Rig Co.
San Francisco — C. A. Watts

Exclusive Builders of Heavy Duty Gasoline Engines for Over Twenty Years

REED AIR IS *CLEAN* AIR

64 REED AIR FILTERS

Protect 4—1250 H. P. Diesel Engines at the New Ponca City, Okla. Power Plant

A better understanding and appreciation of clean air for compressors and gas engines was bound to come with the progressive advance of engineering practice in the oil and gas industry. Hence it is only logical that an investigation of the present air filters on the market should result in an overwhelming preference for Reed Air Filters, with their outstanding advantages of highest efficiency, lowest operating cost, and largest dust capacity.

Reed Air

TRADE *filters* ALL METAL MARK

REED AIR FILTER CO., INC.

LOUISVILLE, KY.

Distributed by

SMITH SEPARATOR COMPANY

Tulsa Okla.

LOS ANGELES SHREVEPORT HOUSTON FORT WORTH

California In The Oil & Gas Industry

The New and Old Field, Signal Hill Long Beach California.

Looking Toward Signal Hill from Northwest

Elk Hills Oil Field, Kern County, California

Alamitos Heights, Long Beach Extension

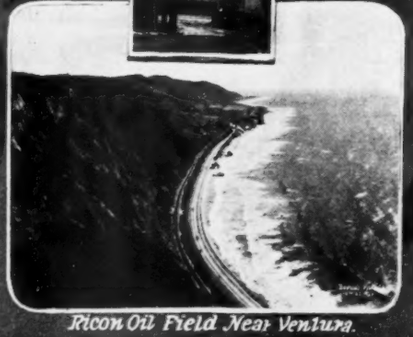
Standard Oil Refinery, El Segundo

Above—General Pet. Corp. #2 Hisey—One of the World's deepest Wells—Ventura Ave. Dist.

Left—Wilshire Oil Co's. Buckbee #1—Discovery well of Santa Fe Spgs., deep zone

A Few Derricks in Santa Fe Spgs. Oil Field

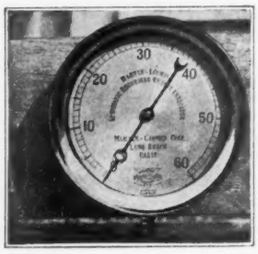
Long Beach Harbor



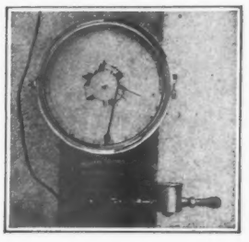
Ricon Oil Field Near Ventura.

Airplane view of Los Angeles Harbor, looking toward breakwater.

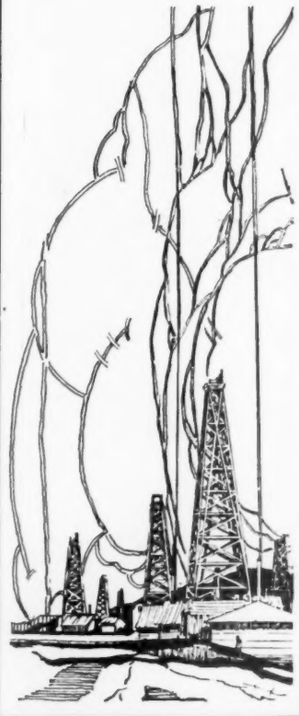
Avenue Oil Field, Ventura, California



THE Martin-Loomis Weight Indicating Gauge, mounted on a derrick girt in constant sight of the driller, gives an accurate measure of the weight on the hook and the weight on bottom at all times. It entirely eliminates dependence upon the "feel" of the brake and, as a result, removes the danger of twist-offs due to "crowding." More service per bit and straighter hole are assured. Whether drilling, coring, or setting pipe the Weight Indicator is invaluable. On fishing jobs it is indispensable.

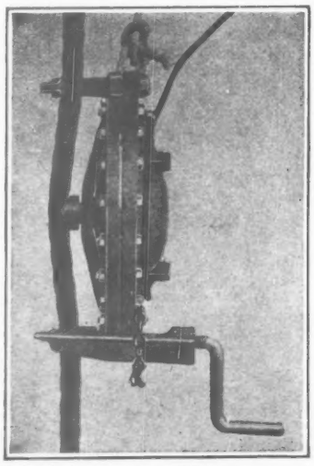


THE Martin-Loomis hookup includes a weight recorder mounted in the belt house. This instrument compiles a complete 24-hour graphic record of all operations at the drilling well. Charts thus compiled give an absolute check on the service obtained from all equipment and may be filed as a permanent record of drilling operations. Cost data carefully kept by one major California operator show that the total upkeep expense of the Weight Indicator is less than 7 cents per day.



Before Spindletop Came In

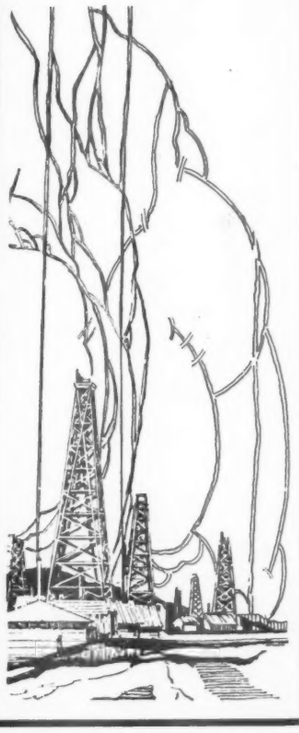
MEMORIES of early "oil" strikes do not easily fade. Crowded with action, color and romance, they may serve to identify a time when primitive drilling equipment began to give way before the touch of ingenious tool manufacturers. Spindletop, for example, came in during 1901. A few years before, 1897, to be exact, W. R. "Frosty" Martin designed and built the first steel constructed portable drilling rig. A portion of this rig is shown in the above picture. Note the steel frame of the machine, cast iron split drive bushing and 2x3 pin on a 10" bit. The entire rig was hauled into the hills of Newhall, California, thirty years ago and used by "Frosty" Martin to drill one of the early wells in that district.



But constructive service to the oil industry did not end with the design of this portable rig.

From this inventive source, comes one of the most helpful contributions to rotary drilling practice — the Martin-Loomis Automatic Recording Weight Indicator.

Careful operators all over the world follow the practice of installing a Martin-Loomis Weight Indicator on each drilling well. It is a practice that safeguards time, tools and equipment. May we or our distributors tell you more?



Mid-Continent Distributors

REED ROLLER BIT CO.

HOUSTON, TEXAS

MARTIN-LOOMIS CORPORATION

2827 Cherry Avenue
Long Beach, California

Foreign Distributors

OIL WELL SUPPLY CO.

PITTSBURGH, PA.

Executive office, warehouse and city yard, Los Angeles
Below: A typical field store of The Republic Supply Company of California

CALIFORNIA
KNOWS THE STORY OF THE
"BUSINESS BUILT ON SERVICE"

HOW, from one store at Coalinga in 1917 the number has increased to stores in all of California's principal oil fields. *How,* from a few lines of miscellaneous equipment our supplies, carefully chosen from famous makes, have been expanded to meet every requirement of the operator. *How,* from no pipe to speak of, our stock of oil country tubular goods has grown into one of the largest in the world. *How,* every company facility has been improved and enlarged to provide for greater efficiency. *How,* through year to year effort, our personnel has made good every definition of the word *service.*

* * * *

To keep pace with California's oil industry, and to deserve the patronage of the many California operators we now enjoy, all these steps in our progress were necessary. That they be continued, *ever striving for the ultimate in supply service,* is the policy of this company.

THE REPUBLIC SUPPLY COMPANY OF CALIFORNIA

EXECUTIVE OFFICES: 2122 EAST SEVENTH ST. LOS ANGELES, CALIF.

BRANCHES:

VENTURA
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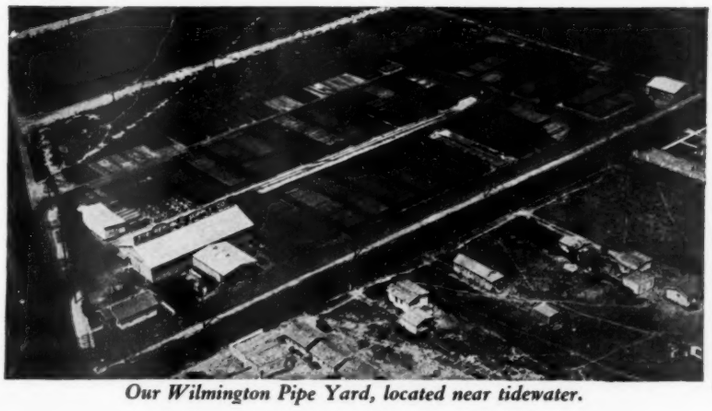
BAKERSFIELD
LONG BEACH



Our Wilmington Pipe Yard, located near tidewater.

BRANCHES:

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SANTA FE SPRINGS
TAFT
RICHFIELD

BRAUN

Birdseye View of 36-Acre Plant at Alhambra, Calif.

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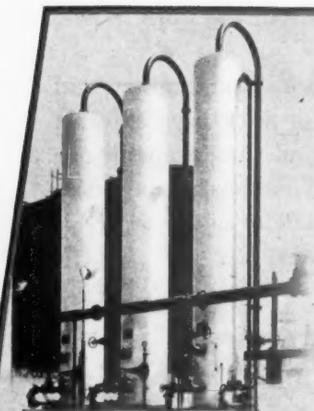
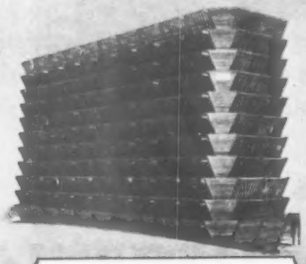
Some Recent CALIFORNIA Installations by

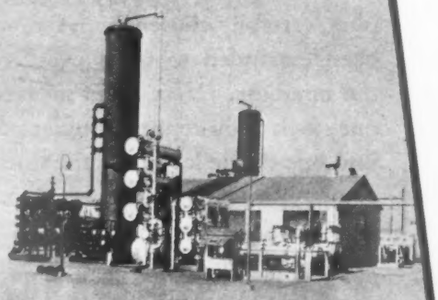
C·F·BRAUN & CO.
Manufacturing Mechanical Engineers
ALHAMBRA, CALIFORNIA



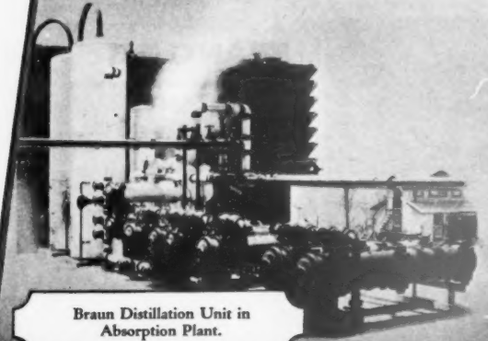
Battery of 3-Braun Bubble Absorbers.



Braun Ventilated Louvre type Cooling Tower.

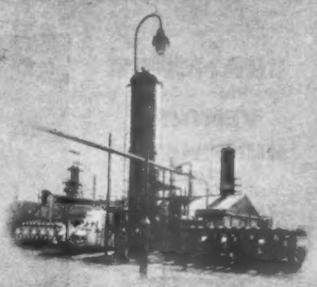


Braun Gasoline Weathering Plant.



Braun Distillation Unit in Absorption Plant.

One of 3-10 ft. diameter Refinery Bubble Towers.



Braun Gasoline Plant Installation in Oil Refinery.

IDECO
STRUCTURAL
STEEL
"TESTED and PASSED"
— Father Time
IDECO Galvanized Structural Steel Derricks have been used by leading California Oil Producers for many years—under the most difficult conditions, their great strength, correct engineering and economy as an investment have proven their unquestioned superiority in the California Oil Fields.
Made in California at Torrance
THE INTERNATIONAL DERRICK AND EQUIPMENT COMPANY
COLUMBUS, OHIO
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DERRICKS
AND RIG EQUIPMENT

Branches and Stocks—Detroit, Mich.; Dallas, Houston, Mexia, Wichita Falls, Odessa, Pyote, Borger, Corsicana, Pampa, Panhandle, Texas; Shreveport, Oil City, La.; Smackover, El Dorado, Ark.; Allen, Sasakwa, Tulsa, Tonkawa, Drumright, Okemah, Seminole, Okla.; Torrance, Los Angeles, Taft, Calif.
Export Representation: 74 Trinity Place, New York City; Columbus, Ohio; Houston, Texas; Los Angeles, Calif. 522

Removing deeply corroded surface of 8-inch transmission line.

Reconditioning Old Gas Lines *with*

McEverlast Protective Coatings and Wrapper—*Applied Cold.*

Corroded—deeply pitted—this section of gas transmission line of the Industrial Fuel and Supply Co., affiliated with the Southern Counties Gas Co. of California, is being salvaged for years of further use. McEverlast electrolysis-proof coatings and wrapper do the trick—make old pipe lines like new ones—save the expense of new pipe!

The soil in which this pipe was buried is so strongly alkaline that it looks almost white. Yet engineers of this big gas company are convinced McEvelast Electrolysis Proof Coating and Wrapper will keep corrosion down to a minimum.

Eliminates Risk of Burns!

It isn't necessary to heat McEverlast coatings. This eliminates accidental burns—work interruptions—costly delays! This cold application allows smaller crews, lower expenses. McEverlast coatings composed chiefly of live Bermudez asphalt and Gilsonite, held in suspension by special process. Properly applied, they form maximum resistance to all forms of corrosion and electrolysis—leave a tough, smooth surface which won't crack or chip.

Permits Smaller Crews!

Some Extensive Users of McEverlast Protective Coatings

Exhaustive field and laboratory tests have proven the effectiveness of McEverlast Protective Coatings. A few of the big industrial users are:

Southern California Gas Company; Shell Company of California; Pan-American Petroleum Company; Sun Oil Company; Simms Oil Company; California Petroleum Company; General Petroleum Company; California Eastern Oil Company; Western Oil and Refining Company; Chanslor-Canfield Midway Company; Union Pacific Railway; Hercules Gasoline Company; City of Los Angeles, and twenty-nine other cities in the Southwest.

McEVERLAST, INC.

[THERE]

(Formerly Everlasting Paint and Sales Co.)

1110 Board of Trade Bldg., Los Angeles, Calif.

Branch Office: 1314 Magnolia Bldg., Dallas, Texas

Withstand Remarkable Test

Pipe protected with one McEverlast Penetration Coat and two coats of Electrolysis-Proof, subjected to a continuous 90 day test with 6 volt potential, 30 days in 5% salt solution and remainder in heavy alkaline soils. At the end of this extraordinary test there was no sign of the coatings breaking down. Send for illustrated descriptive booklet giving details of this test and other interesting information.

Applying McEverlast Osnaburg Wrapper. At the right, applying electrolysis proof coating. Note absence of heating apparatus.

Now - more than 78,246 in service

Breaking records everywhere in reducing drilling costs

Bettis Advantages:

No metal-to-metal contact.

Increased production.

Collars and Tool Joints Saved.

No wear on casing.

Less power consumed.

Fewer twist-offs.

Water breaks reduced.

Save on brake bands.

No metal added to hole.

Save fuel.

More wells drilled per season.

Straighter hole drilled.

Ease on drilling equipment.

Less water to pump.

New Catalog now ready

Patterson-Ballagh Corporation

Insurance Exchange Building—Los Angeles, Calif.

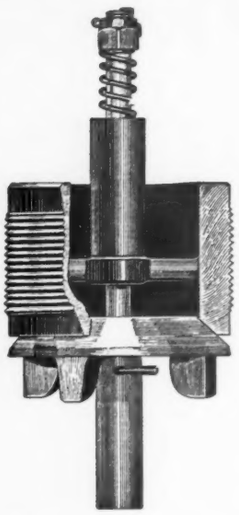
Texas and Louisiana Distributors: Bettis Sales Co., 617 Public Natl. Bank Bldg., Houston

New York Office, 69 Cortlandt St.

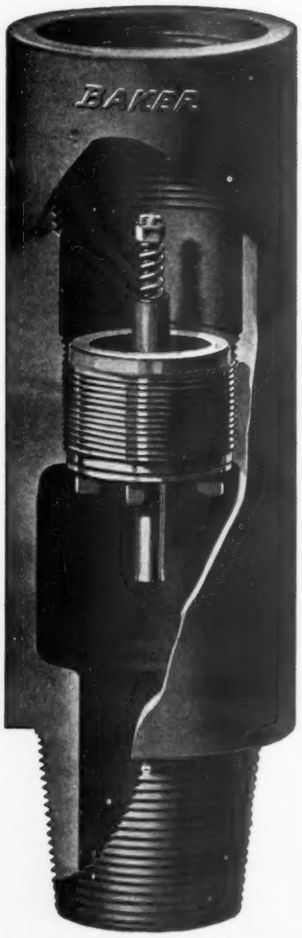
Carried in stock at:

Los Angeles, Santa Fe Springs, Ventura, Long Beach, Houston, New York City

genuine anti-friction Rubbers



Above: Cut-away view of the Baker Patented Valve Assembly in the Baker Drill Pipe Float.



Above—This is the Baker Drill Pipe Float—the complete device—cut away to show how the Baker patented valve assembly functions.

The Valve Assembly

(PATENTED)

of the BAKER Drill Pipe Float

Is the big feature that gives the Baker Drill Pipe Float its remarkable efficiency. Study the diagram to the left for a moment. Note particularly the steel sleeve which allows the valve to open just far enough to permit free circulation; Again note the center projection below and the lugs on the bottom to prevent the valve seating. The center projection keeps the valve from overturning and the lugs on the bottom prevent the valve seating, permitting the free passage of fluid and preventing a plugged string. These additional safety features are of great value in case the valve should become detached.

This extreme simplicity of design, together with its high efficiency in operation, have earned for this drill pipe float the warmest praise from the petroleum industry.

The Baker Patented Valve Assembly is our exclusive design, fully covered by patents, and continues to be one of the most popular items in our line of oil well tools.

You Should Have the Baker Catalog

We will gladly supply you with a copy of the latest issue of the Baker Casing Shoe Company's complete catalog in loose leaf form, in handsome leather binder. Every purchasing agent, field superintendent or other executive in the oil industry should have a copy on his desk for reference.

BAKER CASING SHOE COMPANY

Box L, Huntington Park, California

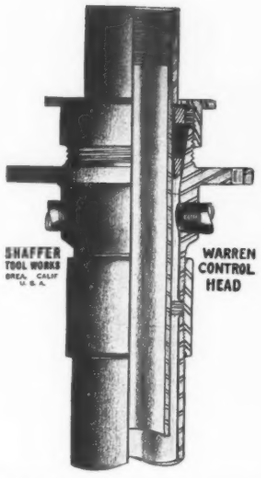
COALINGA, CALIF. BAKERSFIELD, CALIF.
TAFT, CALIF. VENTURA, CALIF.

Export Sales Office:
26 Broadway, New York City

Mid-Continent Representatives:
B & A SPECIALTY COMPANY
220 E. Brady St., Tulsa, Okla.

B&A SPECIALTY CO.

SHAFFER OIL FIELD SPECIALTIES



WARREN CONTROL HEAD OR BLOWOUT PREVENTER.
This type was designed to provide means by which drill pipe, casing or tubing could be packed off while in the hole in case of a threatened blowout and in addition provide means, even with the pipe in the hole, so that connections to shut-off and Christmas tree pipe line connections can be made with a well under perfect control.

Shaffer thoroughly tried and proven oil field equipment is popular with production men in oil fields everywhere. They are dependable, and render a service that makes them almost indispensable where time and economy are factors in drilling and in production.

Patents Applied for

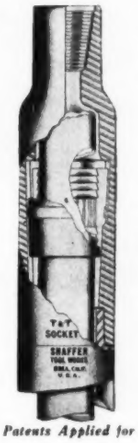
Shaffer

CROSS SECTION SLIPS CLOSED

CROSS SECTION SLIPS OPEN

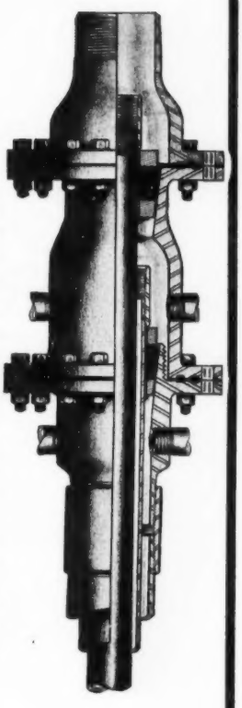
T & T Back-Off Spear
This Spear has only 2 Slips. Practically Impossible to lose in hole. Simple—compact easily backed off.

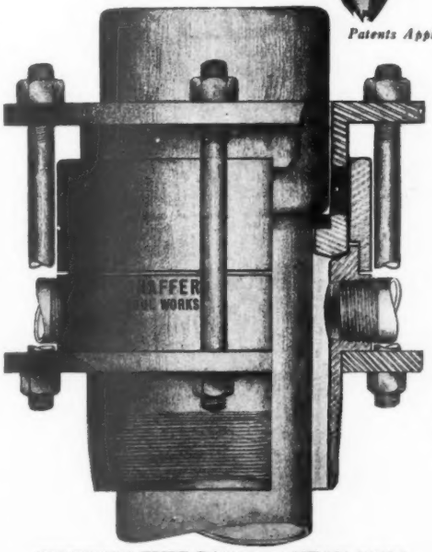
T & T Back-Off Socket
This Socket has only 2 Slips. Simple—compact can be backed off easily.



Patents Applied for

WARREN CONTROL HEAD
This type consists of a control head body to which is attached an intermediate cap member having flanges at both ends. At the upper end of this intermediate cap member there is also provided a recess for a packing assembly so that casings can be landed on the lower body and then a string of tubing landed on the intermediate cap. As many intermediate caps can be used as desired.





WESTERN TYPE PACKING HEAD (CUT SHOWS HEAD WITH DETACHABLE STUFFING BOX). This head is designed to hold any load or pressure the casing itself is capable of sustaining. The weight of the Casing is not used to compress the packing, thus avoiding the possibility of reducing internal diameter of casing.

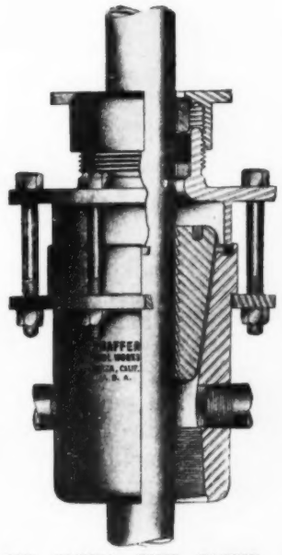
Shaffer Adjustable Flow Bean

Control Flow of Oil and Gas by a Turn of the Gauge

Much labor, time and expense is saved by the Shaffer improved Flow Bean. With its adjustable feature the pressure and rate of flow of Gas and Oil is controlled to any desired degree by a turn of the handle.

FOR PRORATING WELLS Gives You Needle Valve Control

Permits throttling a well to any desired pressure without disturbing the current of oil and gas coming from the well. Useful wherever high pressure needs controlling. Specify the Shaffer Adjustable Flow Bean for the best results.



THE OLINDA TYPE CASING HEAD—The Olinda Type Casing or Packing Head is designed to furnish means by which the casing or tubing can be supported on slips and packed off. This provides a safer support than hanging the casing or tubing on threads. Loads in excess of 5,000 feet and 1,100 pounds pressure have been successfully carried by it.

SHAFFER TOOL WORKS

BREA, - - CALIFORNIA

FOREIGN REPRESENTATIVE
Oil Well Supply Co., Pittsburgh, Pa., London, New York, Tampico

DISTRIBUTORS
Robt. N. Atmore Co., Tulsa, Okla.—Robt. J. Miller Co., Houston, Texas

A record recently made in California: 2,071 feet of hole with only 2 bits, 9 tours, 2 round trips—bits faced with Blackor—the outstanding record.

Blackor is granular and can be flowed on evenly. Nothing to break off.

NOW---the closest approach to diamond-hardness *bonded* in your oil tools

Blackor is more than a hard-facing product. It is fused and bonded into the metal to which it is applied. It will not crumble or break off because it becomes part of the metal instead of being merely welded on. The thicker the application the harder the surface. Its surface presents an entire area of extreme hardness. All points are hard—the closest approach to diamond-hardness known. It outlasts any other surface several times.

Blackor is granular in form, and can be applied by arc-welding in your shop. It is flowed on in a solid mass in much less time.

A booklet will be forwarded on request. Ask for it.

Blackor Company
215 W. 7th St., Los Angeles, Calif.

Distributors:
Big Three Welding & Equipment Co., Inc.
Stores at Fort Worth, Houston, Abilene, Texas, and Tulsa, Okla.

Blackor will not chip.

No insert material needed.

Less time required to apply.

PROTECTED BY AMERICAN PATENT PROTECTION CORPORATION

BLACKOR

—the Super Hard-facing Product

IT HAS BEEN SAID:

EXPERTO CREDE*

"Every Cloud Has a Silver Lining"

When things look bad and you are worried about your production costs you will be relieved to know that you can reduce the gas consumption, as well as the upkeep cost of your boilers and stills, by the use of METTLER ENTRAINED COMBUSTION GAS BURNERS.

In this day and age the modern executive must "keep on his toes" all the time, passing up no opportunity that will better his product and cheapen his cost of manufacture. THE METTLER ENTRAINED COMBUSTION GAS BURNERS are of recognized merit.

Those who have made a thorough investigation, especially the larger refineries, have adopted them as their standard equipment.

Our experienced Cumbustion Engineers will gladly assist you in selecting proper gas burners and arranging combustion chambers so as to obtain the best possible results from your gas fired boilers and stills.

METTLER GAS BURNERS HAVE NEVER BEEN SUCCESSFULLY IMITATED

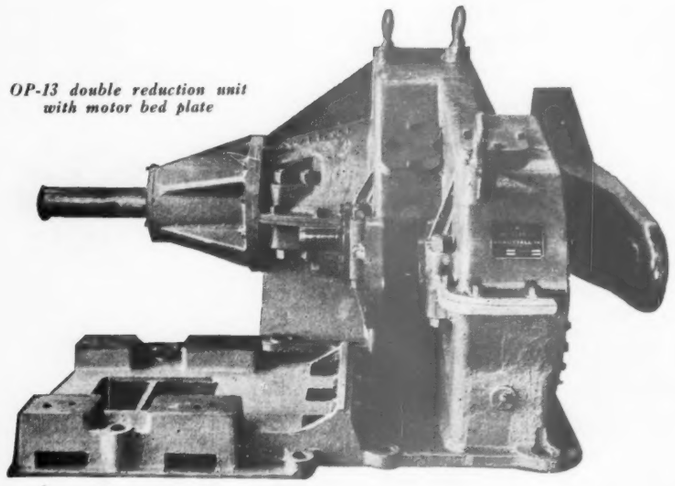
We Solicit an Opportunity to Serve.

*Trust One Who Has Had Experience.

LEE B. METTLER CO.
406 So. Main St.
Los Angeles, Cal.

Please quote Prices on the equipment for the following:

No. of Boilers.....
H. P...... **Make**.....
No. of Stills.....
Size..... **Type**.....
Name.....
Company.....
City..... ***State***.....



OP-13 double reduction unit with motor bed plate

PRACTICALLY a Zero MAINTENANCE Cost

DOUBLE REDUCTION GEAR UNITS *for doubling pumping efficiency*

By actual test a Westinghouse Nuttall Pump Gear Unit manufactured by the R. D. Nuttall Co., Pittsburgh, Pa., operates on practically a zero maintenance cost. The average efficiency of band wheel pumping equipment is about 30%.

The increased efficiency of Westinghouse-Nuttall Units means pronounced savings in power and maintenance costs, resulting from the elimination of band wheel, belts and other equipment which are a constant source of shut-downs and production losses.

The gears in Westinghouse-Nuttall Units are especially treated by the famous BP "tough-hard" process which gives our gears four times the wear resistant quality of ordinary carbon steel gears, and we further insure smooth, even and vibrationless operation of our Units by grinding the teeth of these gears to the true involute tooth form.

Westinghouse-Nuttall double reduction pump gear Units offer the most efficient and economical means of transmitting power and transforming speed, as proved in numerous applications to all types of power, operating under every conceivable condition.

Further information can be secured from any office or branch of the Oil Well Supply Company, or from the district offices of the Westinghouse Electric and Manufacturing Company.

OIL WELL SUPPLY CO.
Authorized Distributors

Send for a set of our Oil Well Bulletins

Westinghouse-Nuttall

"OIC" VALVES

Tested and approved by the oil industry for every valve requirement

OIC

Distributed by

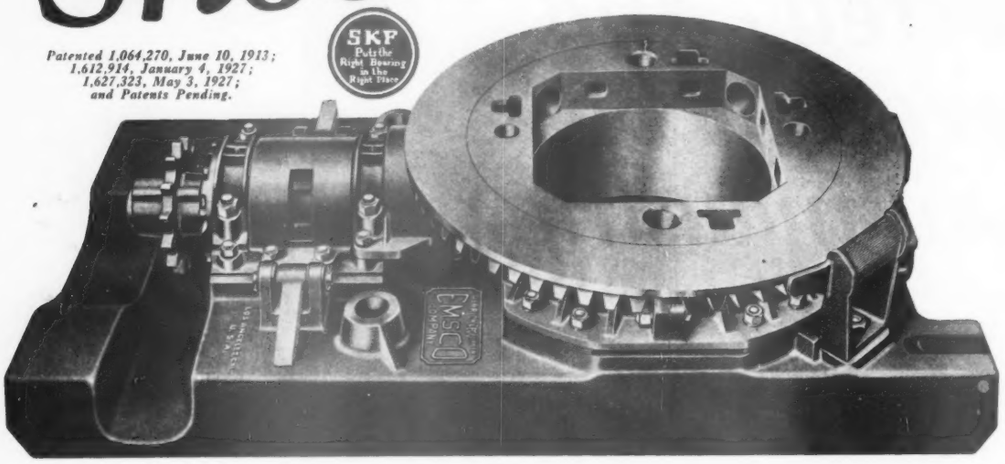
BRANCHES IN ALL PRINCIPAL FIELDS

INTERNATIONAL Supply Company

Shock-Proof!

Patented 1,064,270, June 10, 1913; 1,612,914, January 4, 1927; 1,627,323, May 3, 1927; and Patents Pending.

SKF Puts the Right Bearing in the Right Place



EMSCO Type "DA" ROTARY MACHINE

For The Most Grueling Service

25½-inch Opening in the Rotary Table

HIGH priced S. K. F. roller bearings, mounted in the *one-piece bearing housing* secured to the heavy *one-piece, all steel base,* gives maximum resistance to the heaviest drilling shocks.

The *one-piece bearing housing* insures positive alignment and the S. K. F. self-aligning roller bearings require no adjustment.

The large, alloy steel, hardened and ground cone rollers in the table bearing insure trouble-free performance.

Cut-tooth gears guarantee long life and quietness in operation.

EMSCO A Complete Line of Better Oil Well Equipment

D+B A Complete Line of Better Pumping Equipment

Protected by Steel

EMSCO DERRICK & EQUIPMENT COMPANY
LOS ANGELES, CALIF., HOUSTON, TEXAS-DALLAS, TEXAS
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EXPORT OFFICE: 150 BROADWAY
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U. S. A.

EMSCO STEEL EQUIPPED WELLS ARE SAFE

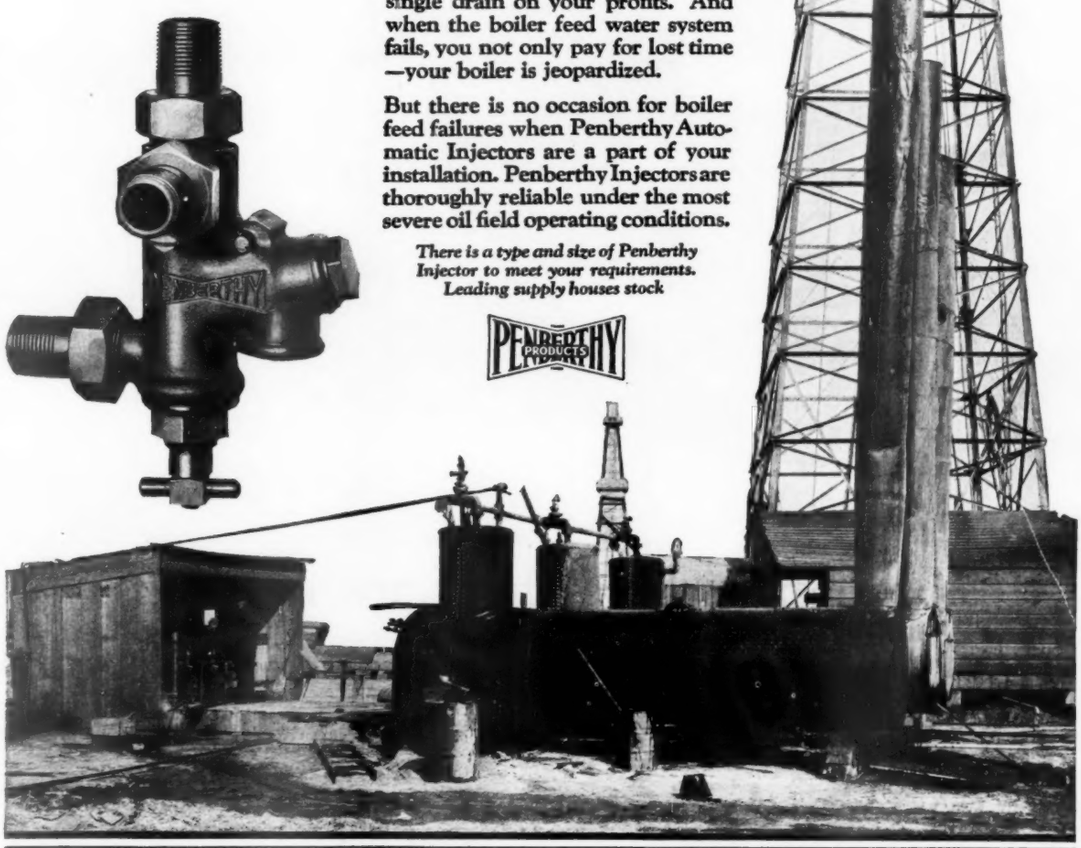
Eliminate Shut-down costs with Penberthy Automatic INJECTORS

When you eliminate the cost of the unproductive time of your field plant, you remove the greatest single drain on your profits. And when the boiler feed water system fails, you not only pay for lost time —your boiler is jeopardized.

But there is no occasion for boiler feed failures when Penberthy Automatic Injectors are a part of your installation. Penberthy Injectors are thoroughly reliable under the most severe oil field operating conditions.

There is a type and size of Penberthy Injector to meet your requirements. Leading supply houses stock

PENBERTHY PRODUCTS

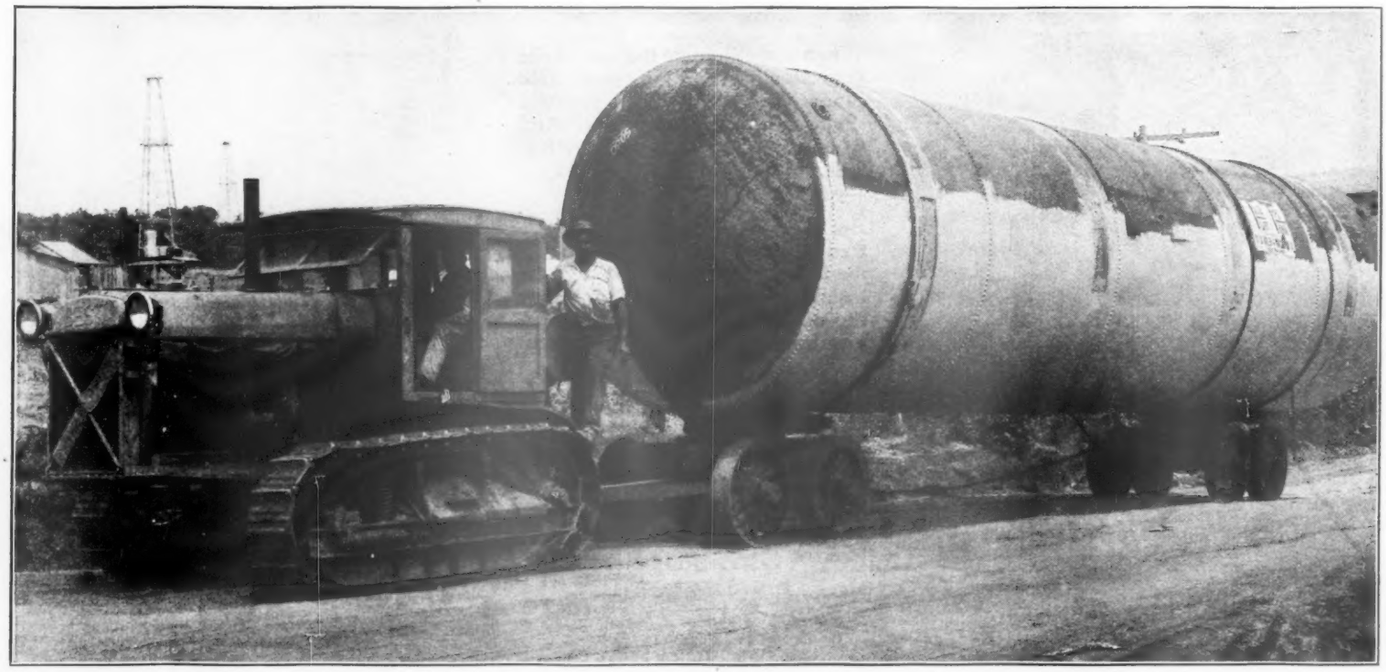


PENBERTHY INJECTOR COMPANY

ESTABLISHED IN 1886 — DETROIT — CANADIAN PLANT WINDSOR, ONT.

Safely delivered

When a "Caterpillar" tractor starts out with a load behind it's almost a sure thing that it delivers! Mud can't stop it—nor rough, rutty roads—nor sand. The "Caterpillar" can



freight 'cross country where there are no roads—or stop and build roads if there be need. Oil field hauling problems are solved by the wide tracks and extra power of "Caterpillar" track-type tractors. And now winch-fitted "Caterpillars" help with a multitude of chores around wells and refineries.

SIXTY - $4600
THIRTY - $2650
TWENTY $2175
F. O. B. San Leandro or Peoria

2-TON - $1675
F. O. B. Peoria

CATERPILLAR TRACTOR CO.
Executive Offices: San Leandro, California, U.S.A.
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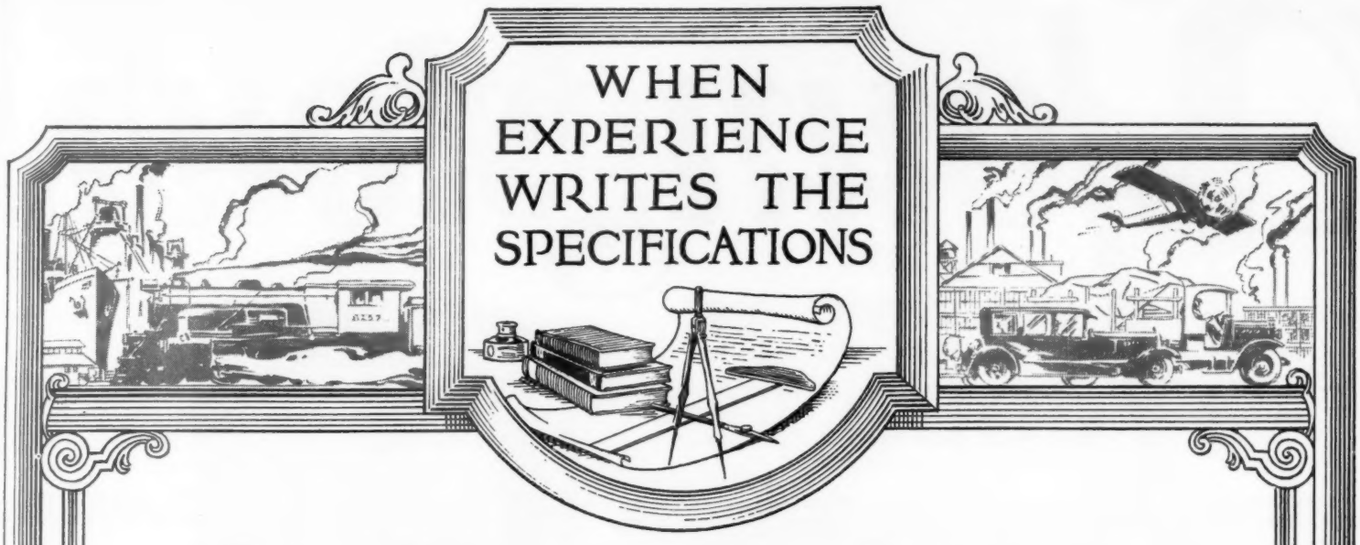
Successor to
BEST C. L. Best Tractor Co. The Holt Manufacturing Company HOLT

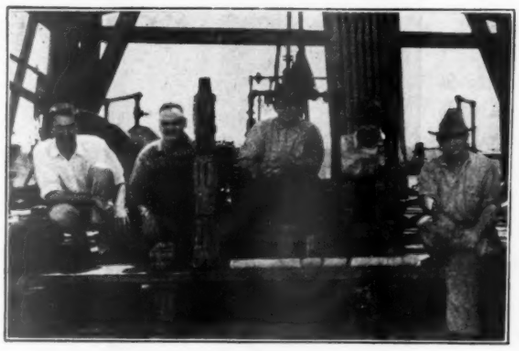
CATERPILLAR
REG. U.S. PAT. OFF.
TRACTOR



REED ROLLER BIT COMPANY

Uses Nickel Alloy Steel for Oil Well Tools

Nickel Alloy Steel Tools manufactured by REED ROLLER BIT CO., Houston, Texas, used in drilling Kelly Well No. 1 at Luling, Texas. Reed Rock Bit, Reed Reamers in tandem, Reed Rock Core Bits and fishing tools are shown.



FOUR years of difficult drilling—through a mile of rock formation—were required to bring the Kelly Well No. 1 at Luling, Texas, to its ultimate depth of 7500 feet. Throughout this long period of heavy drilling Nickel Alloy Steel tools and cutters stayed on the job and did not fail. Reed Rock Bits, Reamers and Rock Core Bits were the drilling tools used—all are made of Nickel Alloy Steel.

The unusual physical properties of Nickel Alloy Steel—its toughness, hardness, strength and wear-resistance—insure unfailing performance under severe drilling conditions. These properties, combined with correct design, contribute much to the reputation for reliability established by Reed tools throughout the country's oil fields.

The performance records of the Nickel Alloy Steel parts used by leading manufacturers are conclusive evidence of the dependable mechanical properties of these alloys. The experience of representative users has contributed to an extensive fund of valuable technical information. You are invited to consult our engineers and draw upon these data.

Send for "Buyers' Guide to Nickel Alloy Steel Products"

FOR STRENGTH WHERE THE STRESS COMES — NICKEL STEEL

Nickel
FOR ALLOY STEEL

List of available publications on Nickel and its alloys furnished on request. Write for it.

INCO NICKEL — THE INTERNATIONAL NICKEL COMPANY (INC.), 67 WALL STREET, NEW YORK, N. Y. — INCO NICKEL

"Youngstown

PIPE IS GOOD PIPE

Lapweld and Seamless

YOUNGSTOWN Pipe for the oil and gas industry is made to A.P.I. Standards in all sizes and types.

For more than 20 years the Youngstown Sheet & Tube Company—America's largest independent manufacturer of tubular goods—has been producing pipe which is known as *good* pipe in oil and gas fields the world over.

"If CONTINENTAL Sells It, There Is No Better"

THE CONTINENTAL SUPPLY COMPANY

General Offices: St. Louis
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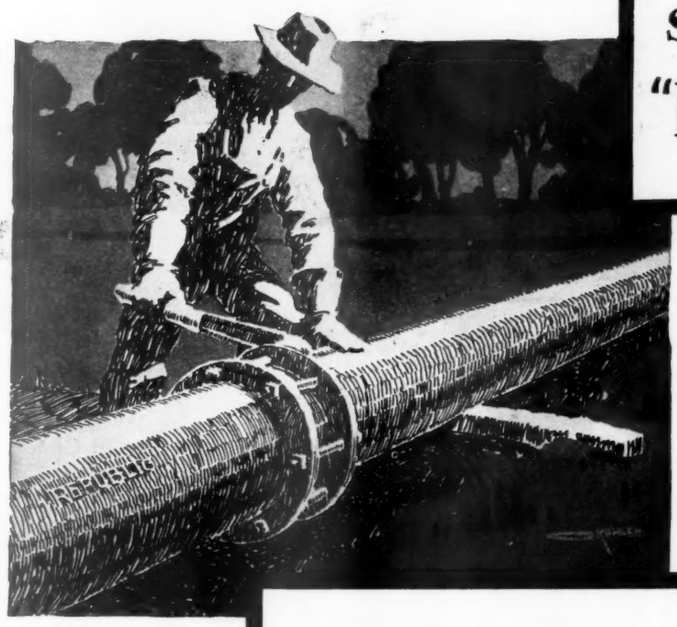
THE CONTINENTAL SUPPLY COMPANY, Ltd.,
411 Lancaster Bldg., Calgary, Alberta, Canada

CONTINENTAL

PUT YOUR PIPE RESPONSIBILITIES SQUARELY UP TO "REPUBLIC"



PRODUCTS
Tubing
Casing
Line and
Rotary
Drill Pipe

THE responsibilities of oil country pipe are taken into consideration when Republic tubular products are being made. Strength . . . uniformity . . . sound welds . . . clean, perfect threads . . . resistance to corrosion necessary for durability . . . these are innate "Republic" qualities, assured by careful manufacture and by tests and inspections more rigid even than standards require.

Republic Pipe Lines are reliable . . . they can be trusted to "carry on" trouble-free through the years.

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IRON & STEEL CO. YOUNGSTOWN O.
PIPE & CASING

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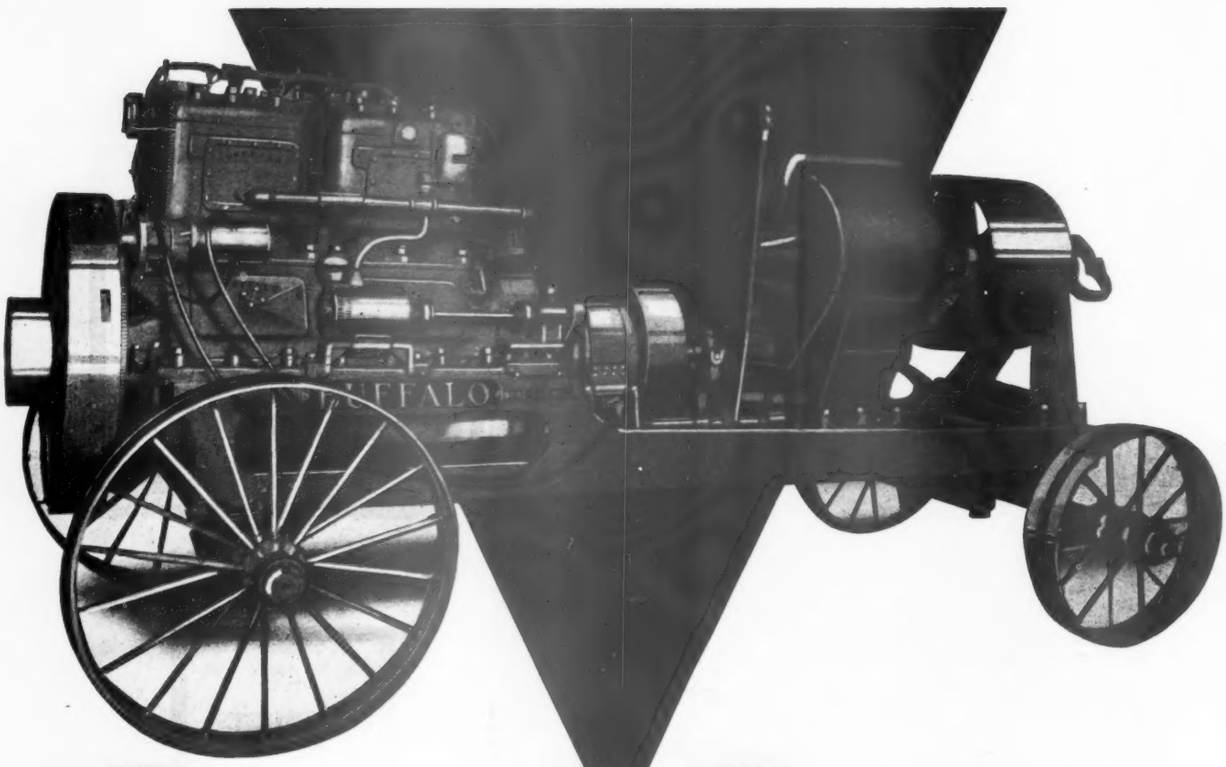

Reserve Power

As easily operated as the gear shift of an automobile, the two-speed transmission of the Buffalo "PB" Drilling Unit gives reserve power when it is needed. By simply operating a lever you have a gear reduction of 5 to 1, practically doubling the driving power at the belt pulley.

F. C. Lawrence, contractor, El Dorado, Kans., says:

> "I am using a number of drilling engines, and I can highly recommend the Buffalo "PB" type with the two-speed transmission. This low gear is sure fine on a drilling engine, especially in handling pipe. These engines drill just as good as steam, and a great deal cheaper. My engine is running for about $8.00 per day of 24 hours."

The Buffalo Drilling Unit is easy to move, easy to set up. It operates on either natural gas or gasolene. The water consumption is small. It is economical in fuel and oil. It cuts down time lost through breakdowns, reduces operating costs.

Write today for booklet which tells all about the Buffalo Drilling Units.

BUFFALO GASOLENE MOTOR CO.
1282-1292 Niagara St. - - - - - Buffalo, N. Y.

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Louden Tool Co.
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JENKINS CRACKING PROCESS

PRODUCES QUALITY GASOLINE

Facts from performance

As cracking has changed the price structure of gasoline, so is the Jenkins Process changing the price structure of cracked gasoline.

It will be well worth your time to investigate this claim.

GRAVER *Founded 1857* *Corporation*

EAST CHICAGO, INDIANA

NEW YORK Grand Cent. Term. · CHICAGO America Fore Bldg. · FORT WORTH Petroleum Bldg. · LOS ANGELES Pacific Nat'l Bank Bldg.

In the Wilson-Snyder Slush Pump—Timken Bearings for Life

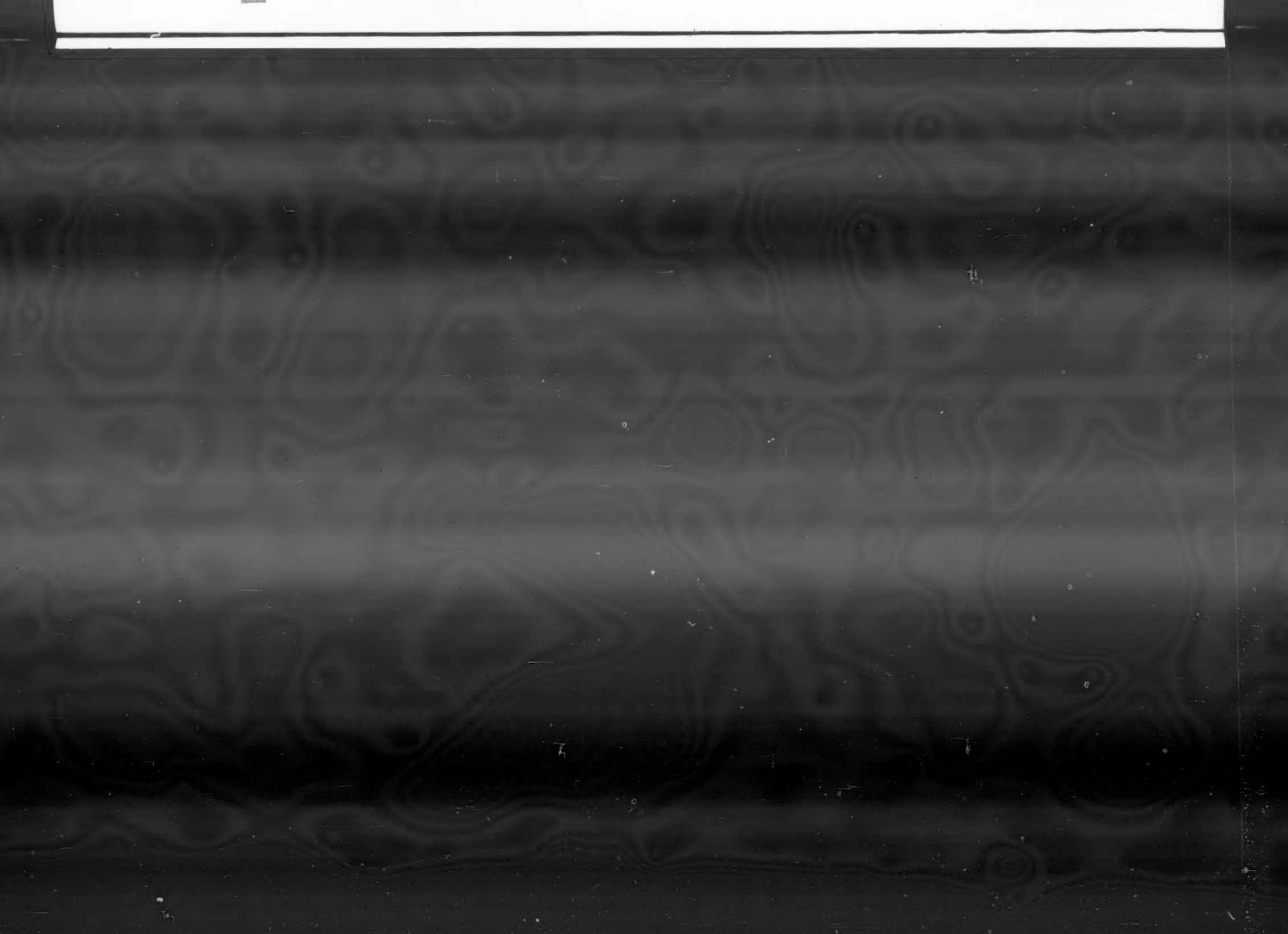
Wilson-Snyder Manufacturing Company, Pittsburgh, Pa., now furnish their slush pump to be driven by steam, electric motor, or internal combustion engine. Many valuable features are included as a result of veteran experience in building heavy-duty pumps. Crankshaft, crank pins and pinion shaft have the extra "usefulness expectancy" that comes to all parts that are mounted on Timken Bearings.

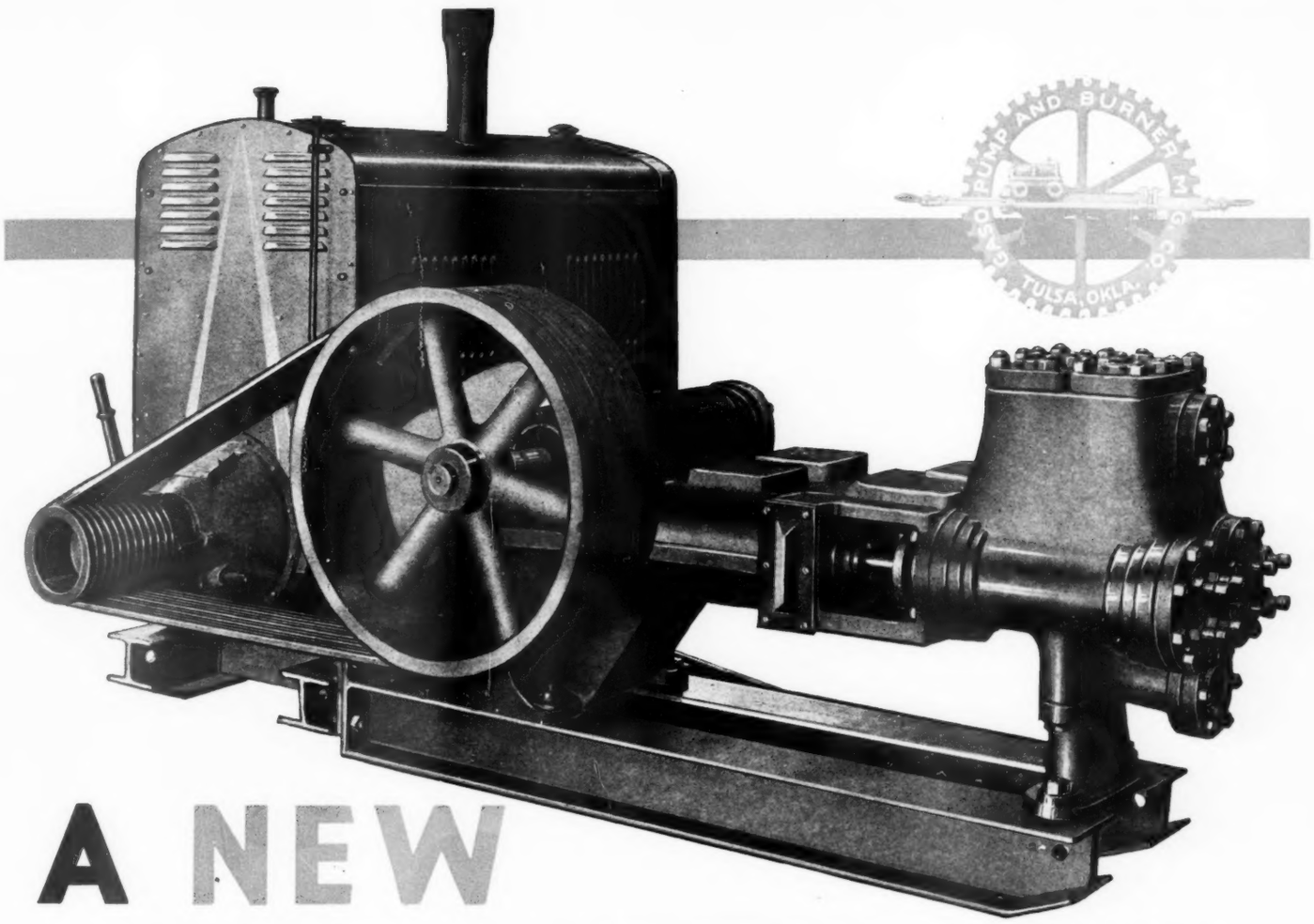
Not only parts but entire machines benefit by Timken outstanding friction elimination; by Timken capacity for all loads including thrust; and by Timken utmost durability.

It is inevitable that Timken Bearings make machines run smoother and longer at lowered power costs, with less lubricant and with minimum attention. Friction's threat of high operating costs and early depreciation is successfully met by Timken tapered construction, Timken *POSITIVELY ALIGNED ROLLS* and Timken electric steel—and so widely acknowledged in the oil fields that they use more Timken Bearings than all other anti-friction makes combined.

THE TIMKEN ROLLER BEARING CO., CANTON, OHIO

TIMKEN
Tapered
ROLLER BEARINGS





A NEW GASO PUMPING UNIT

for Semi-Permanent and Permanent Pipe Line Stations

The need of a portable pumping unit especially adapted for small semi-permanent and permanent pipe line stations—led us to design this new GASO unit.

The pump is especially rugged, efficient and durable. It is our GASO No. 710 Enclosed Type, Self-Lubricating Power Pump, for working pressures up to 1400 lbs., with interchangeable liner fluid end taking liners from 2½" up to 7" diameter and giving capacities from 38 gallons per minute at 1400 pounds pressure up to 351 gallons at 300 pounds pressure.

Every working part of this pump is protected from dust by the oil-tight case, and runs in an oil bath. Pinion shaft bearings are TIMKEN TAPER ROLLER BEARINGS, and main bearings are lined with genuine babbitt, both being easily adjustable to wear. Open hearth steel continuous tooth herringbone gears, center driven, running in oil, insure highest efficiency and quietness.

The power plant is a BUDA 85 H.P. 4-cylinder engine, and drive is the highly efficient and durable Tex-Rope drive.

The unit is mounted on sturdy steel H-Beam skids.

This unit is also ideal for any other oil field service requiring the above capacities and working pressures. Write, wire, or phone for further information.

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